RF Channel Characterization and Estimation: Experimental Results

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Chapter 1

Processing of Experimental Data

We use the data analysis tools and techniques described in the main report to process data collected in the HMMWV and ship-to-shore experiments. Channel delay spread functions were estimated using the system identification technique (AF estimator) described in Chapter 6 of the main report.

To assist in assessing the dispersive nature of the RF channel represented by each of the data sets, we use 'excess delay spread' as a measure. To calculate this quantity, we first estimate the 'total' and 'local' power delay profiles. The total power delay profile is an average over the channel delay spread functions spanning the entire 5.6 secs of data. We calculate the local power delay profiles by sectioning the channel estimates into 100 contiguous segments and averaging over each segment. The result of this procedure is an array of local power delay profiles each spanning approximately 0.056 secs of data. Using these estimates we calculate the channel delay spread σ_τ defined in Chapter 2 of the main report. When estimating σ_τ we neglect values of the power delay profile less than -35dB. Then, from σ_τ we subtract the delay spread resulting from the entire RF system (excluding the channel) using the power delay profile estimated from the reference data set ref1.snp (Chapter 8) to get the total and local excess delay spreads.

The experimental results from each data set consist of five plot types: (1) the total power delay profile estimate, along with the reference power delay profile representing the RF system (from ref1.snp); (2) the estimated local and total excess delay spreads; (3) an image of the channel delay spread function estimates plotted over time; (4) the scattering function estimated using 14 non-overlapping spectral averages; (5) the sequence of 100 local power delay profiles and 100 local averaged spectrums of the channel delay spread function estimates.

The HMMWV experimental results are in Chapter 2. Chapter 3 contains the results of the ship-to-shore experiment conducted January 21-22, 1998.

Chapter 2

HMMWV Data

The following table lists the HMMWV experimental data sets and the corresponding pages of the processing results:

Data Set	Pages		
hmmwv1306.snp:	3	-	14
hmmwv1313.snp:	15	-	26
hmmwv1318.snp:[1]	*	-	*
hmmwv1325.snp:	27	-	38
hmmwv1328.snp:	39	-	50
hmmwv1330.snp:[2]	51	-	62
hmmwv1333.snp:	63	-	74
hmmwv1335.snp:[2]	75	-	86
hmmwv1338.snp:	87	-	98
hmmwv1340.snp:	99	-	110
hmmwv1342.snp:	111	-	122

[1] Low Rx SNR. AF failed to acquire signal.
[2] Low Rx SNR. Noise has degraded AF performance.

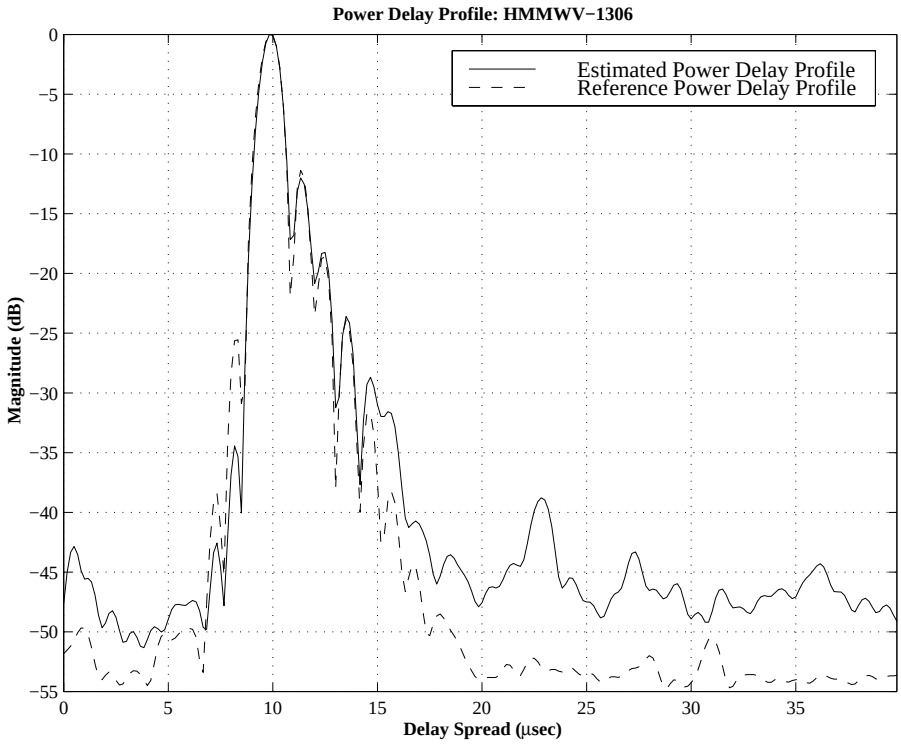

Figure 2.1: Power delay profile for hmmwv1306.

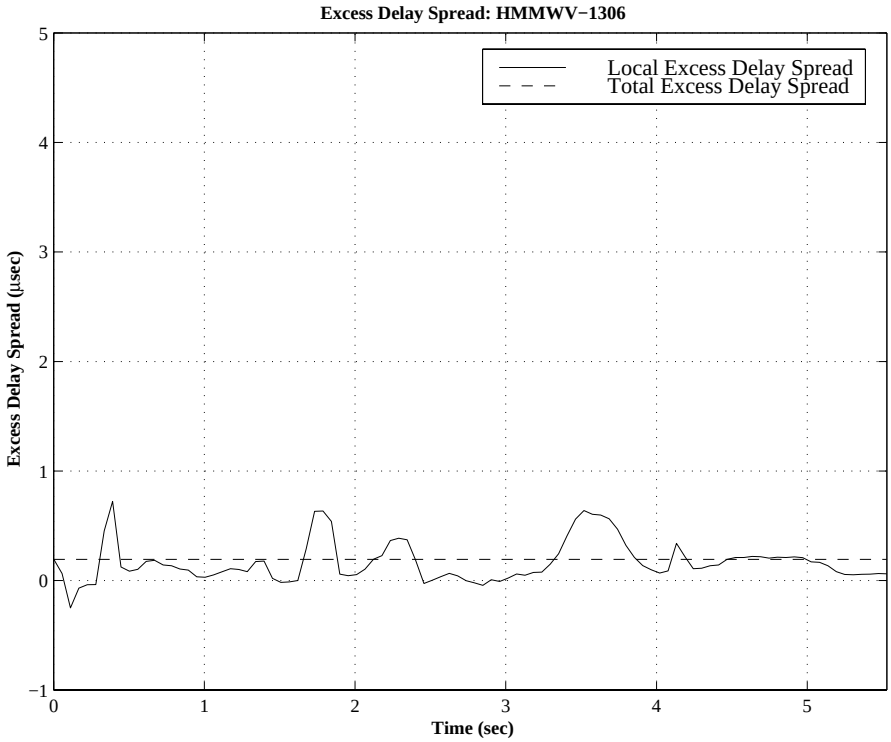

Figure 2.2: Excess delay spread for hmmwv1306.

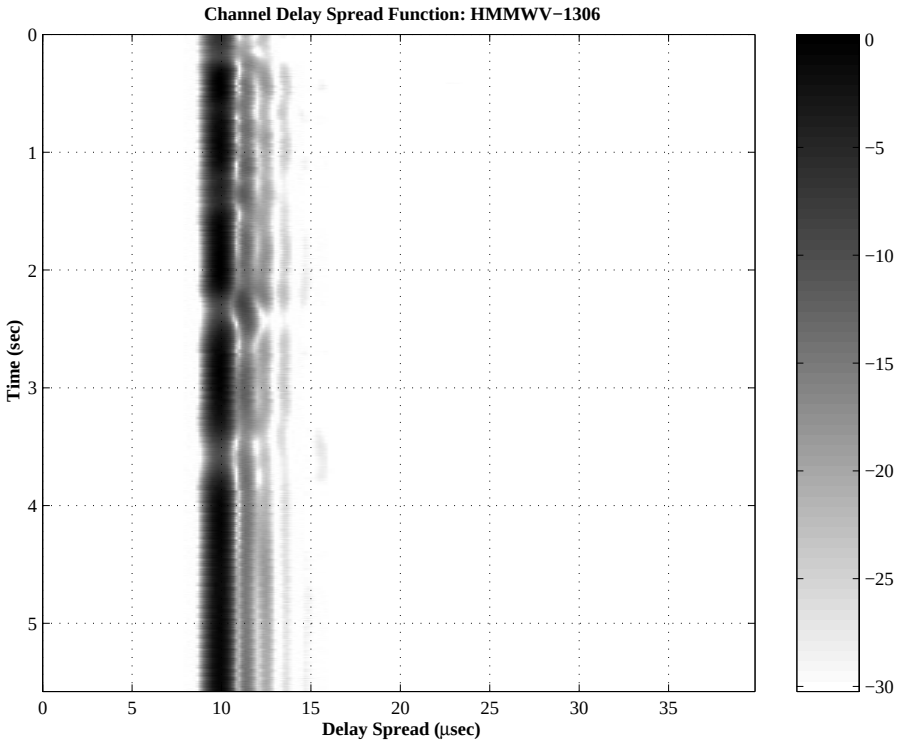

Figure 2.3: Channel delay spread function for hmmwv1306.

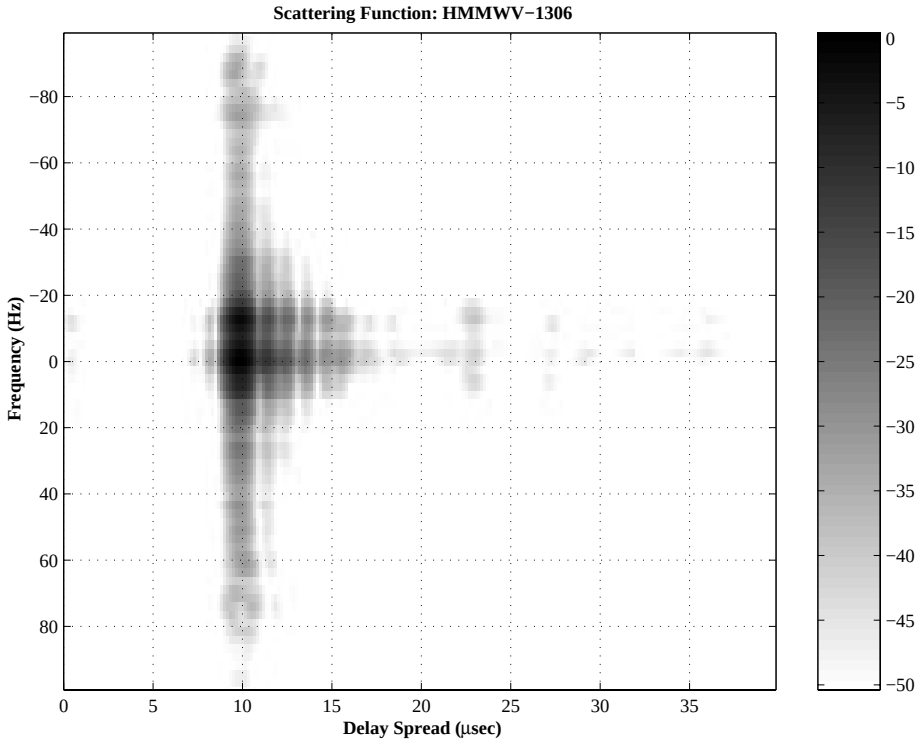

Figure 2.4: Scattering function for hmmwv1306.

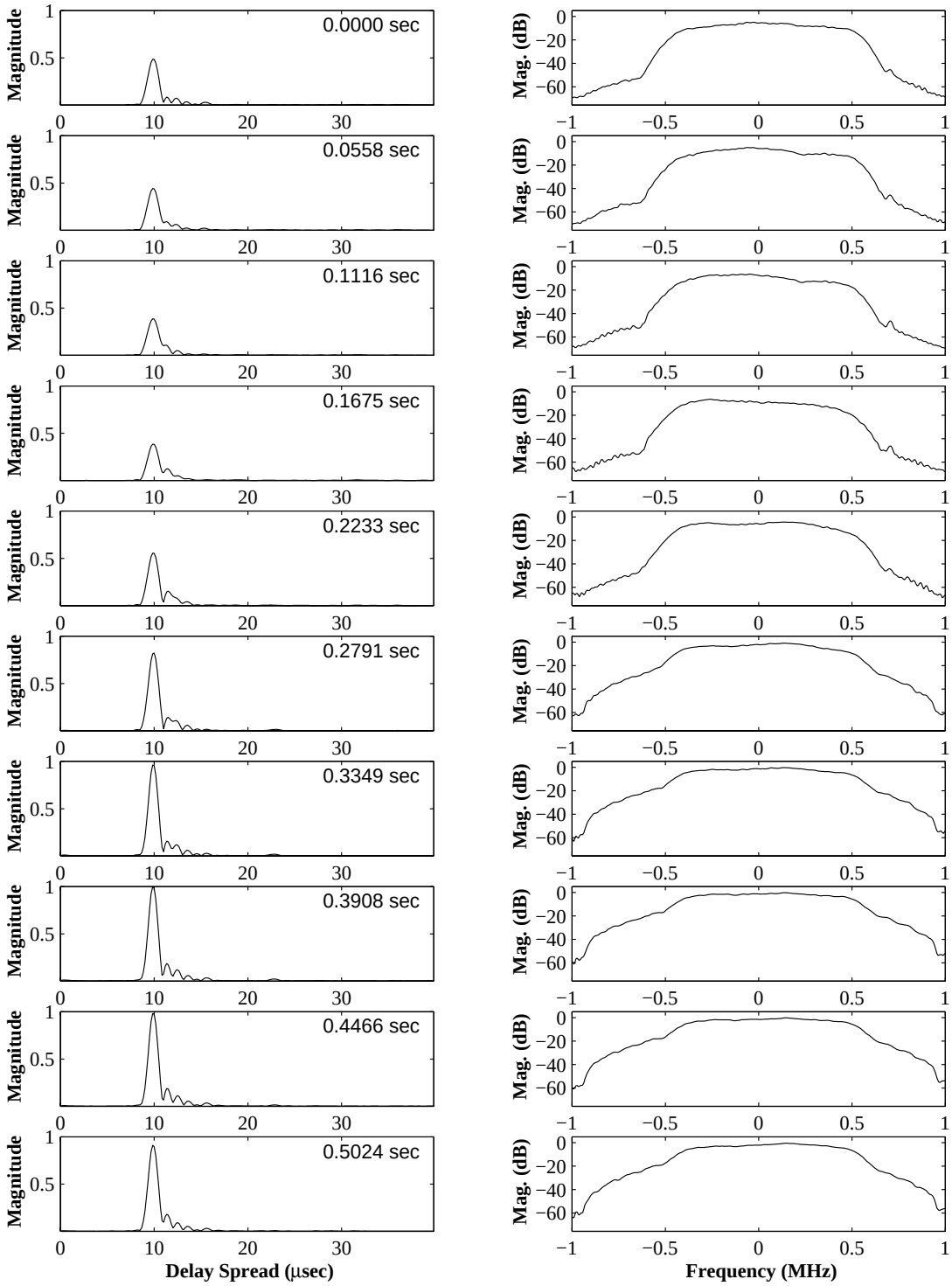

Figure 2.5: Local power delay profiles for hmmwv1306 (1).

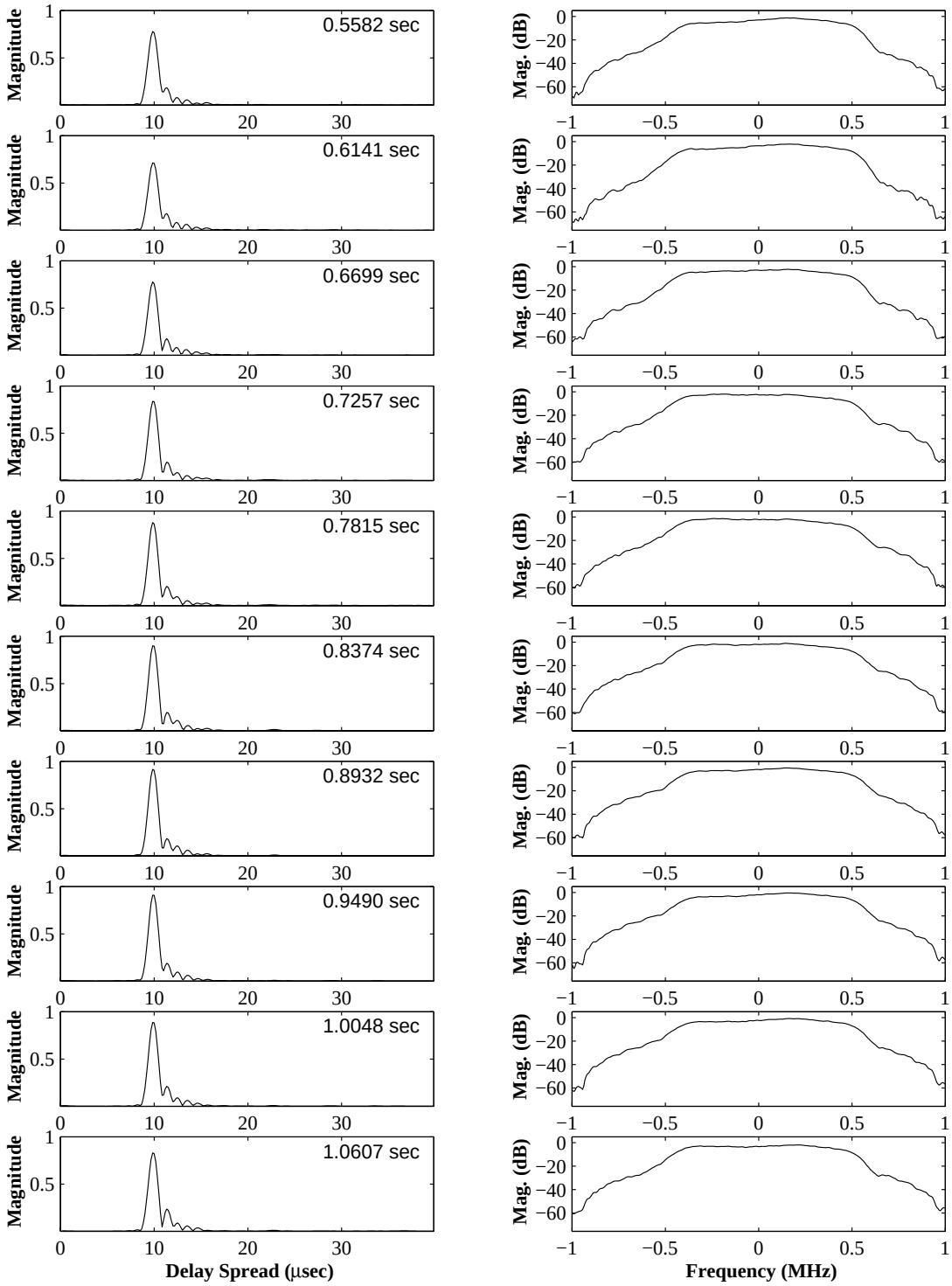

Figure 2.6: Local power delay profiles for hmmwv1306 (2).

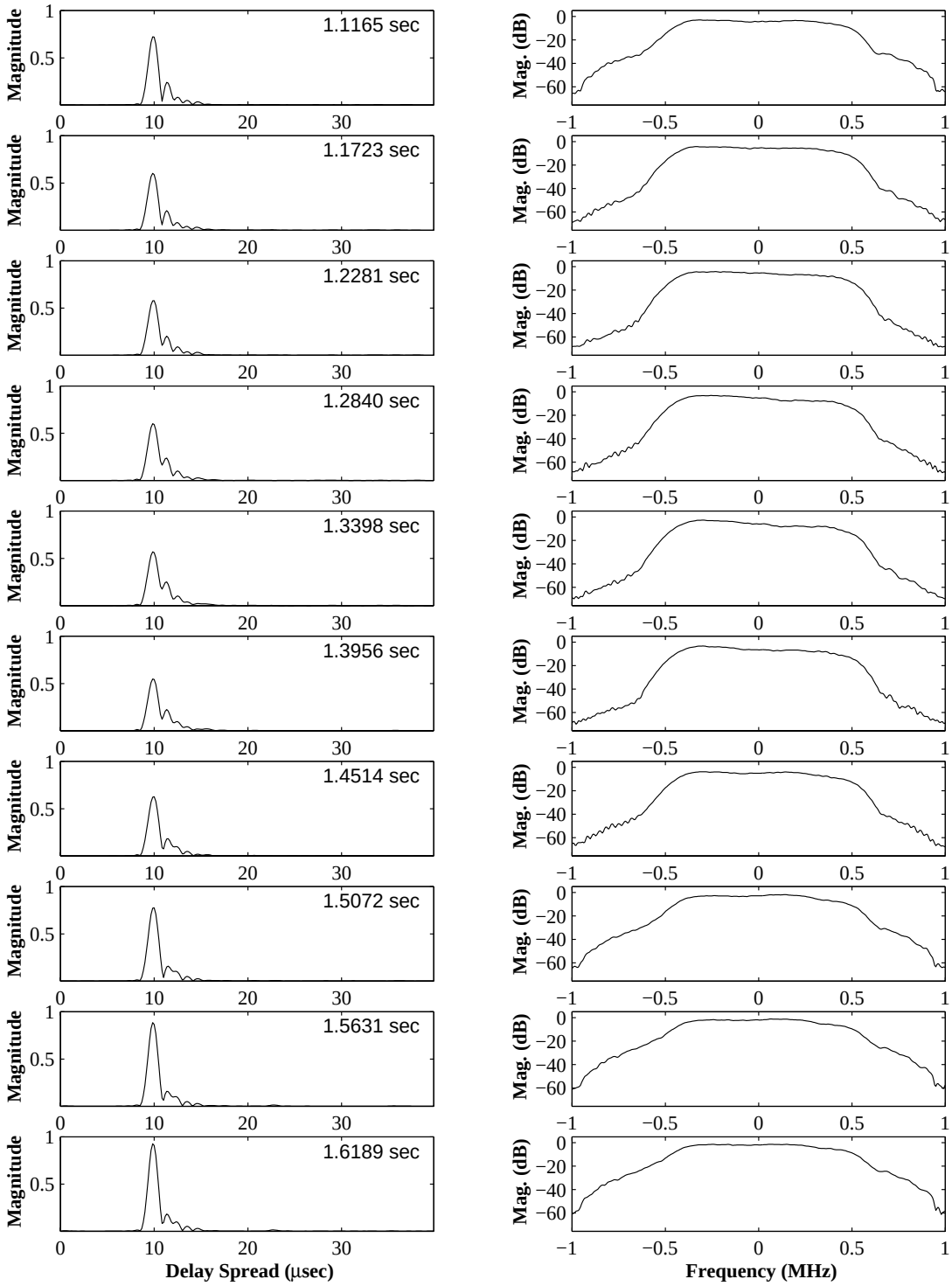

Figure 2.7: Local power delay profiles for hmmwv1306 (3).

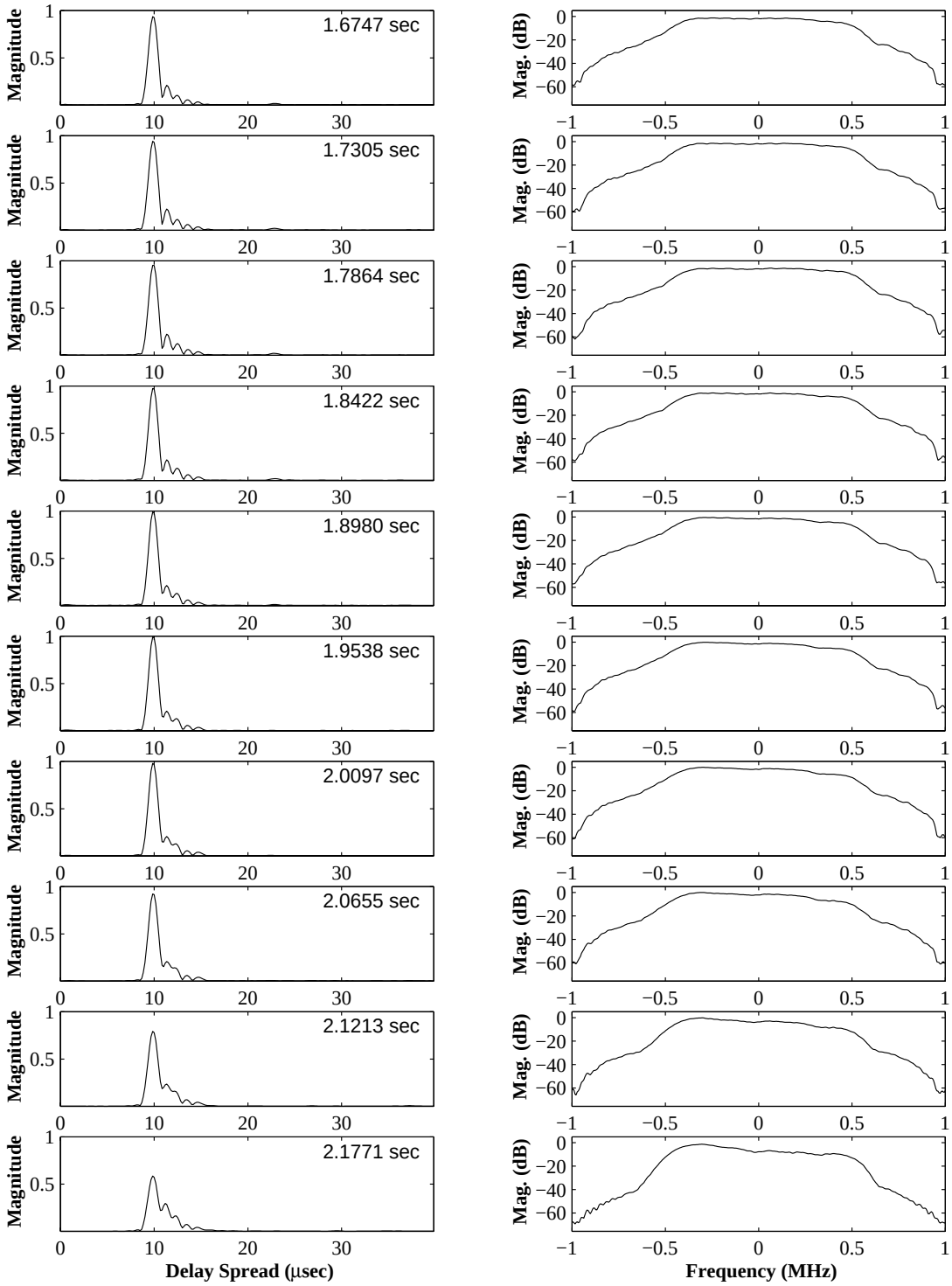

Figure 2.8: Local power delay profiles for hmmwv1306 (4).

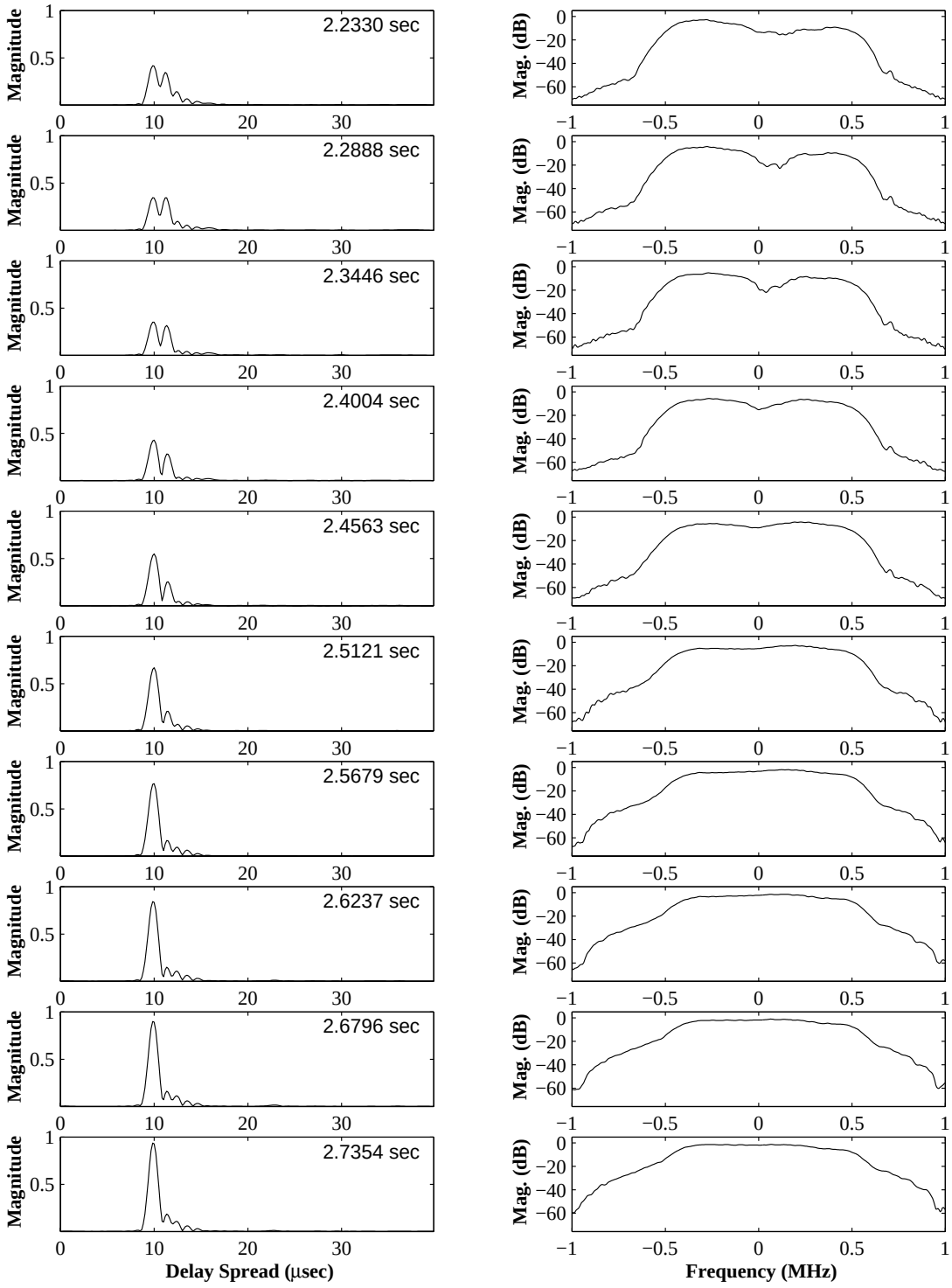

Figure 2.9: Local power delay profiles for hmmwv1306 (5).

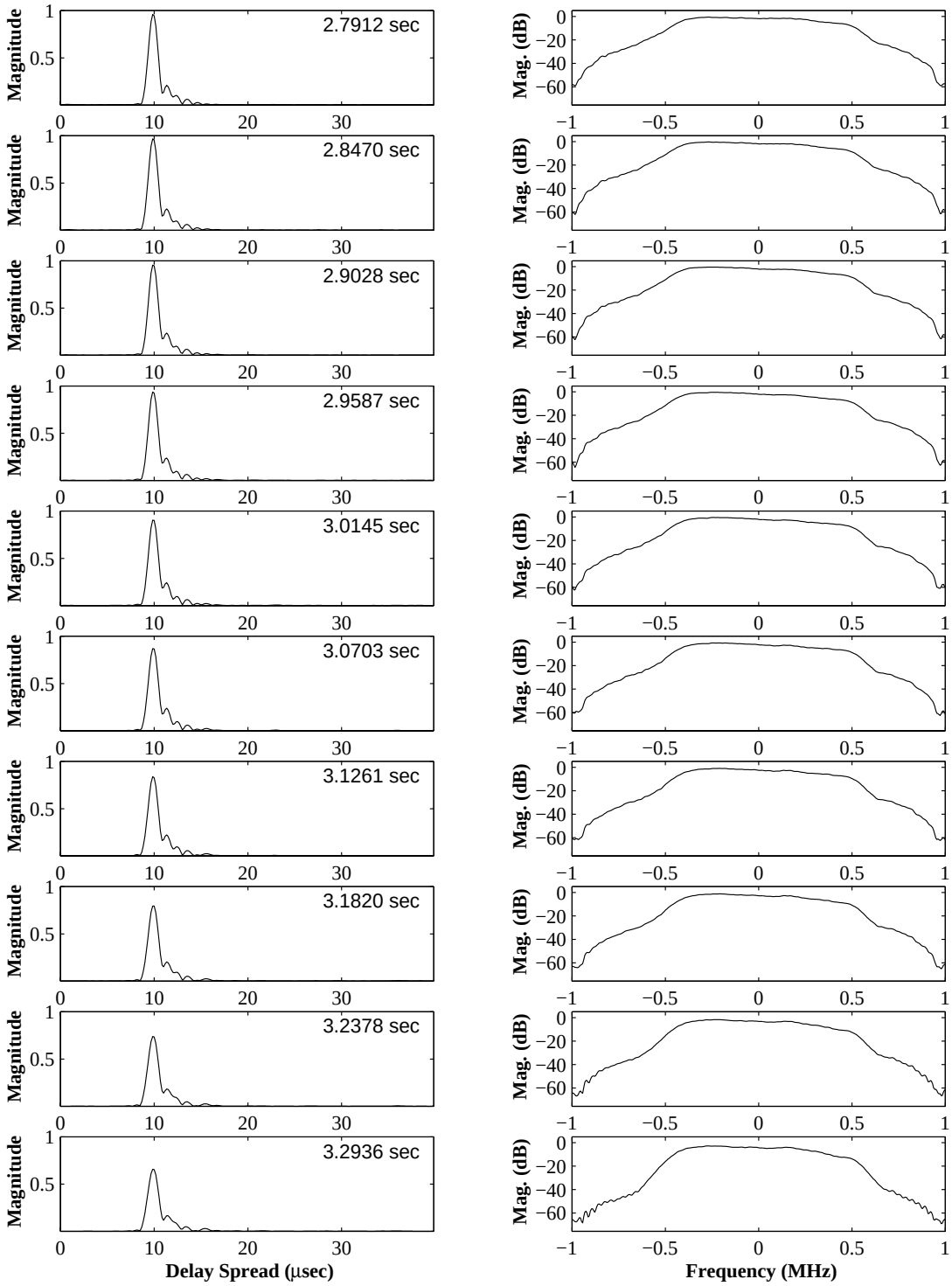

Figure 2.10: Local power delay profiles for hmmwv1306 (6).

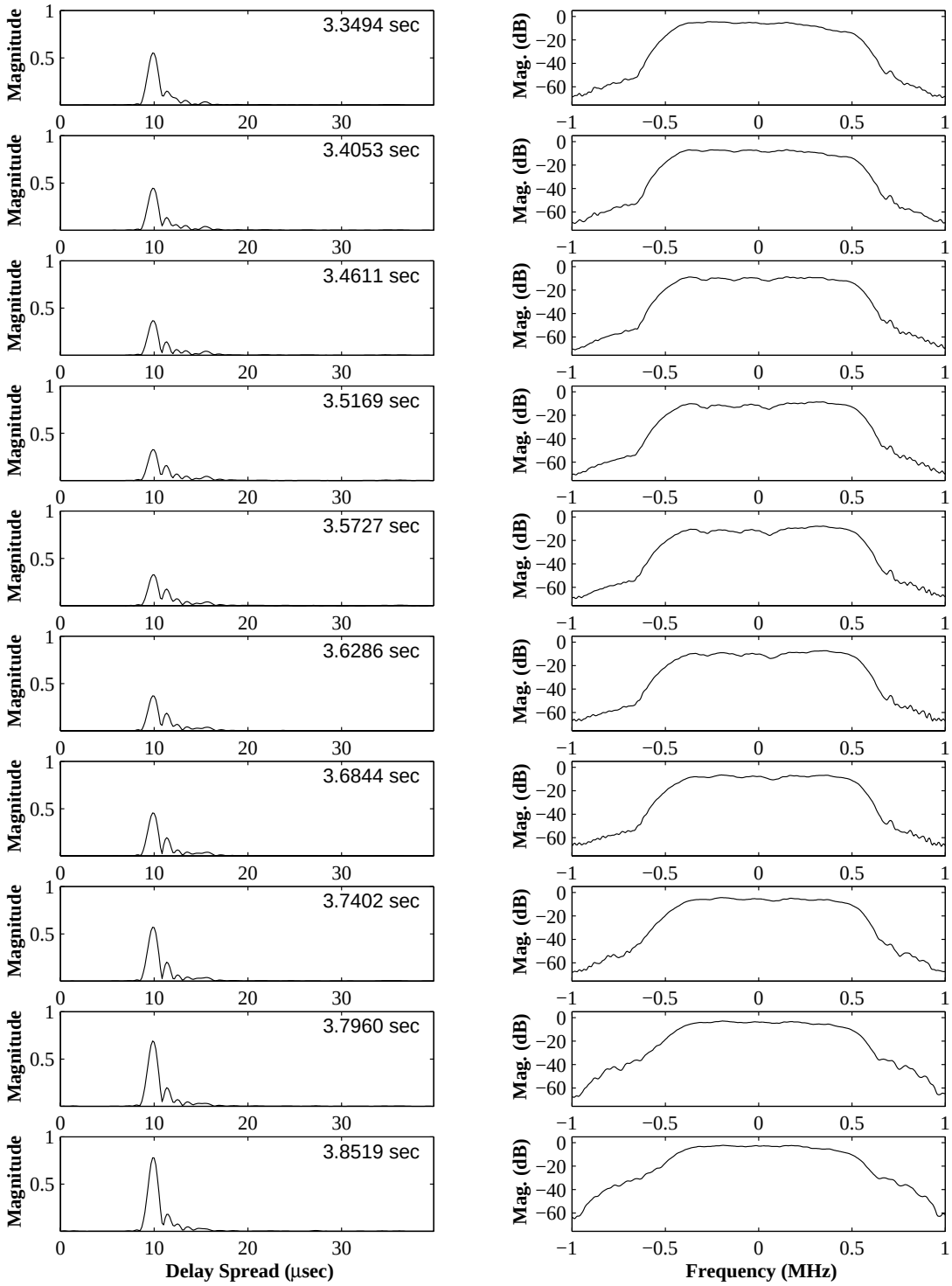

Figure 2.11: Local power delay profiles for hmmwv1306 (7).

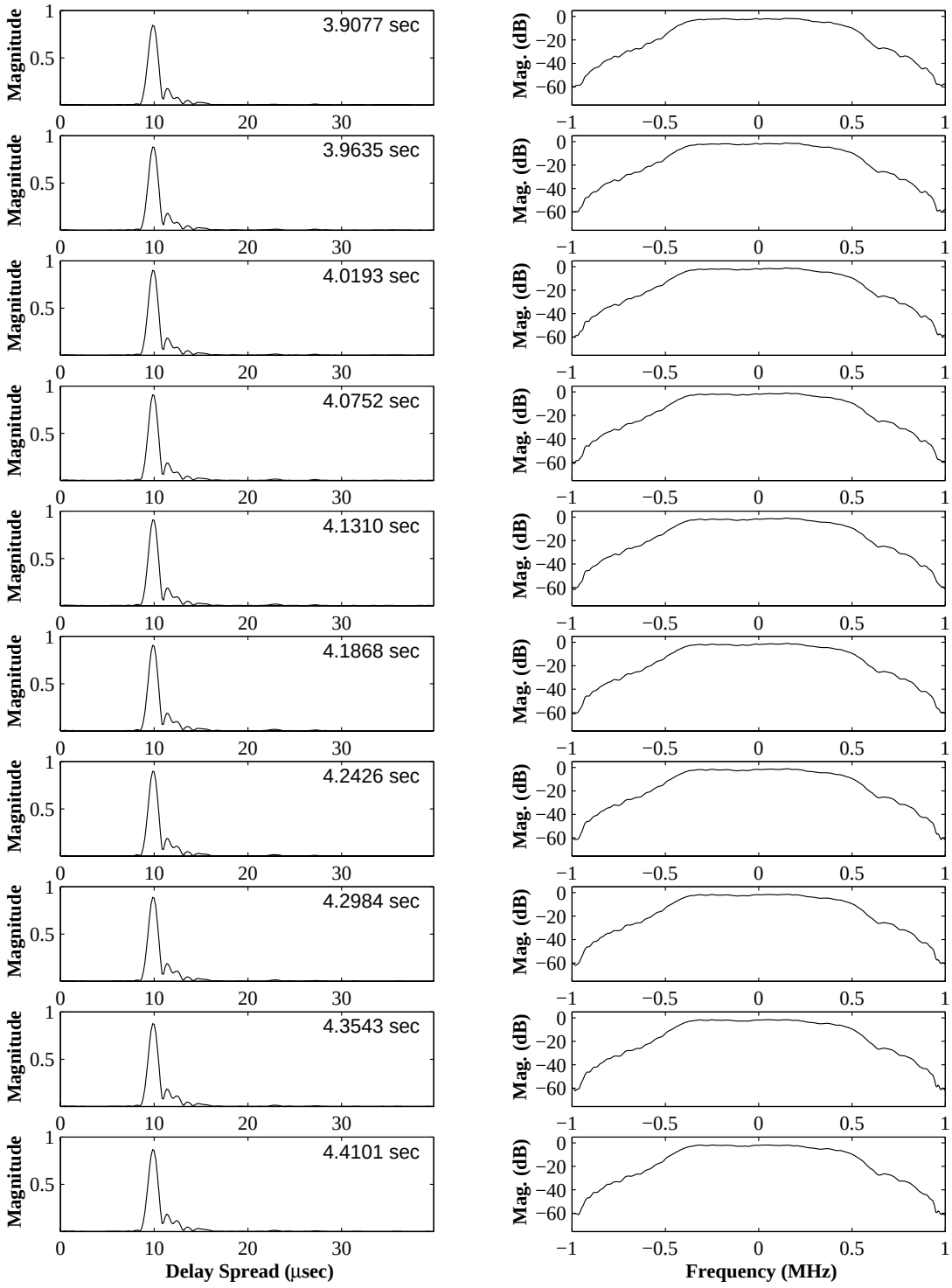

Figure 2.12: Local power delay profiles for hmmwv1306 (8).

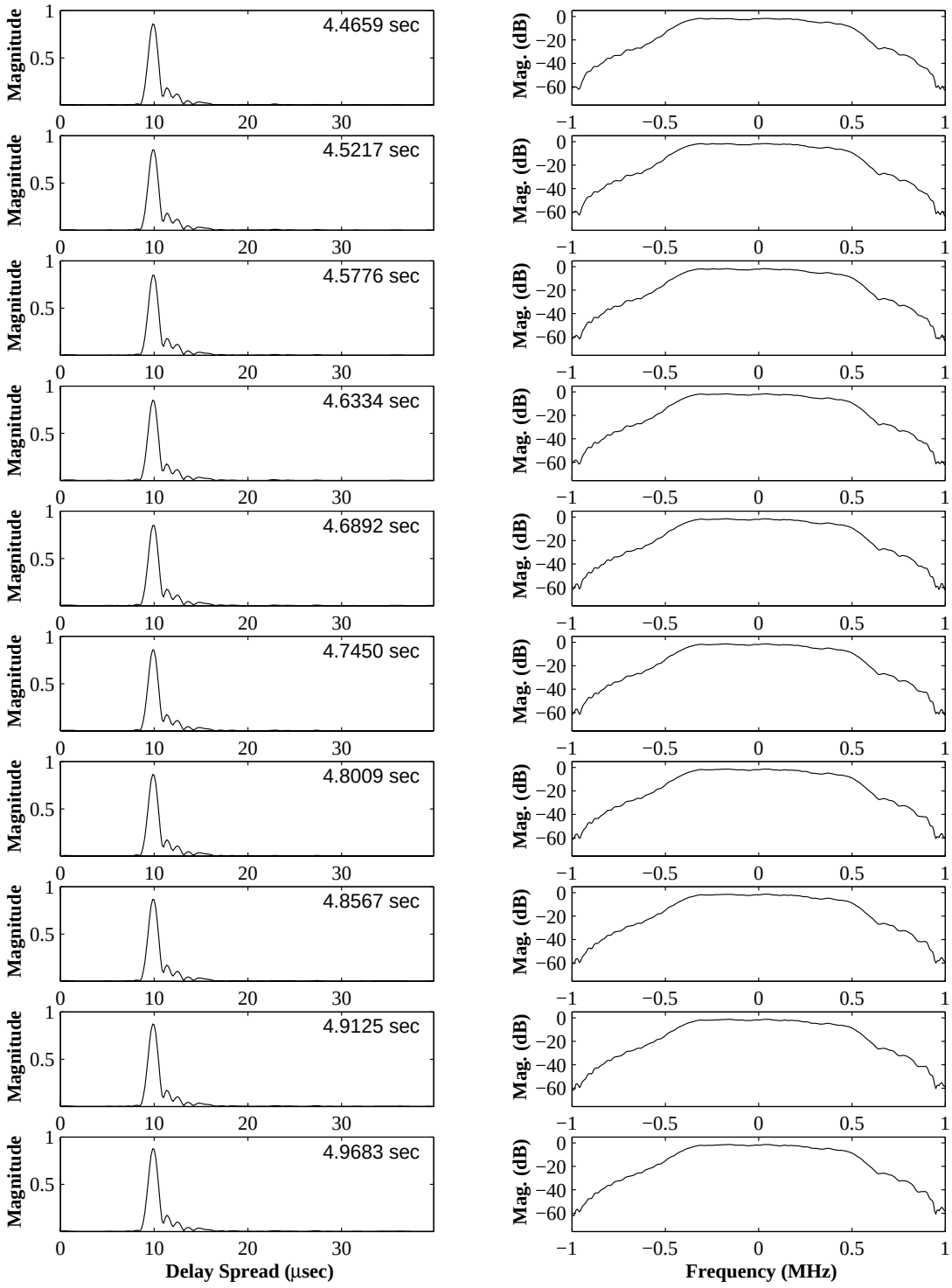

Figure 2.13: Local power delay profiles for hmmwv1306 (9).

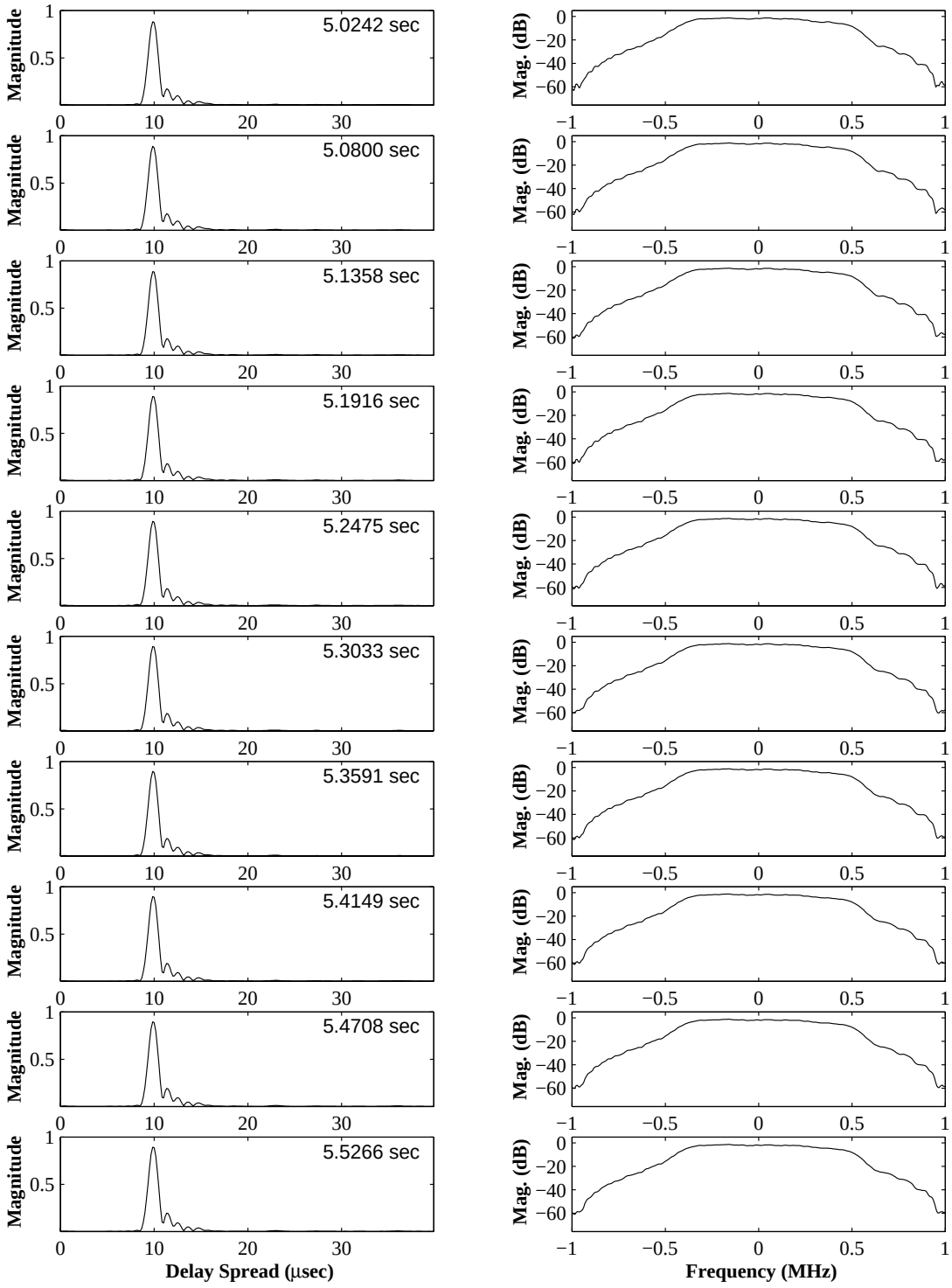

Figure 2.14: Local power delay profiles for hmmwv1306 (10).

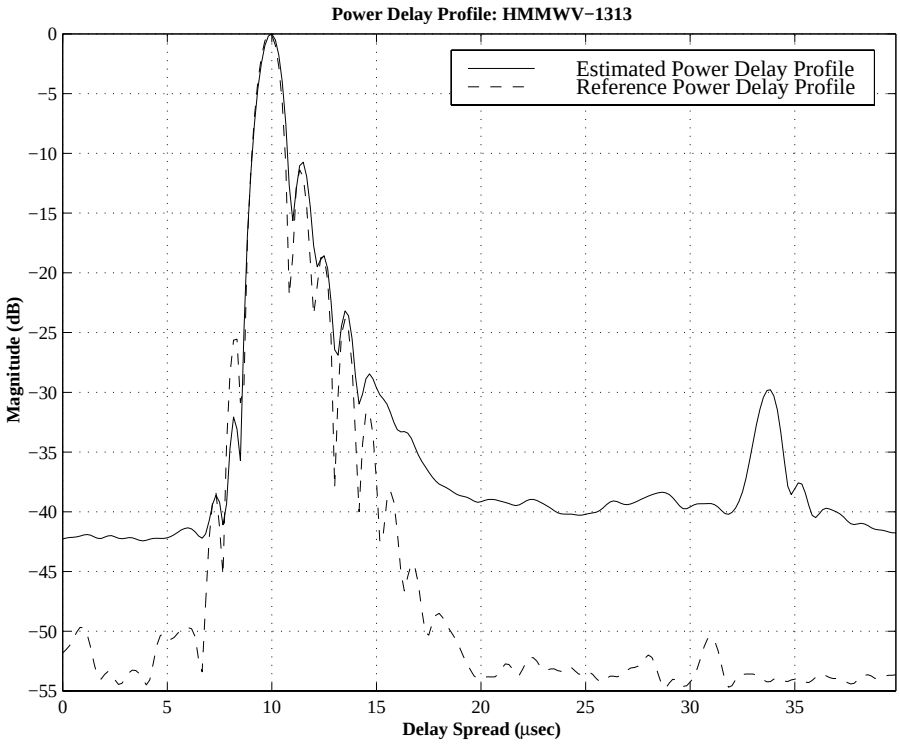

Figure 2.15: Power delay profile for hmmwv1313.

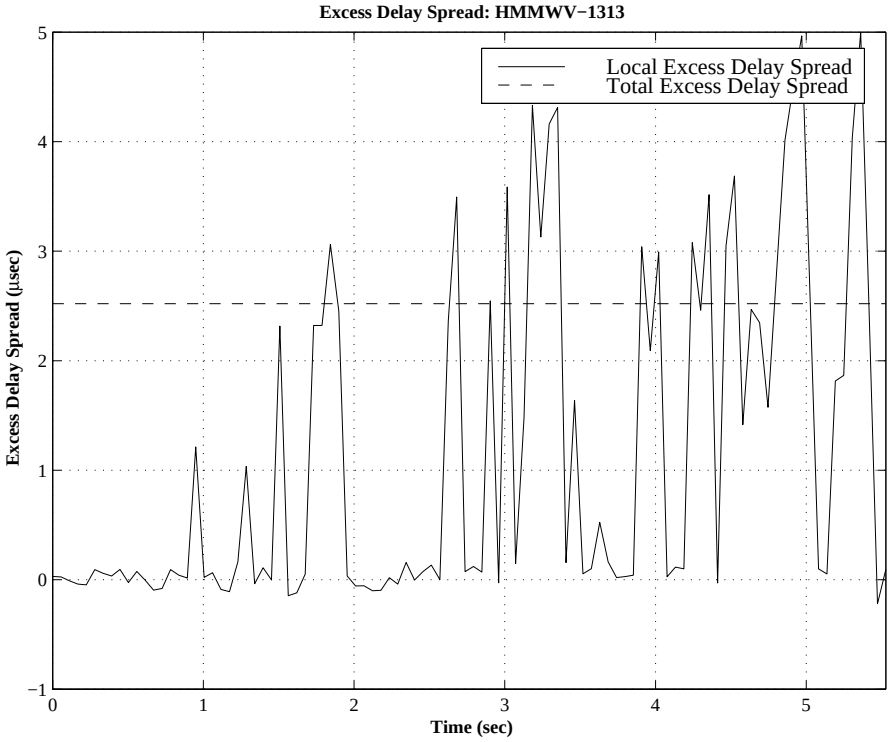

Figure 2.16: Excess delay spread for hmmwv1313. Deep fades causing distortion of the local excess delay spread estimates.

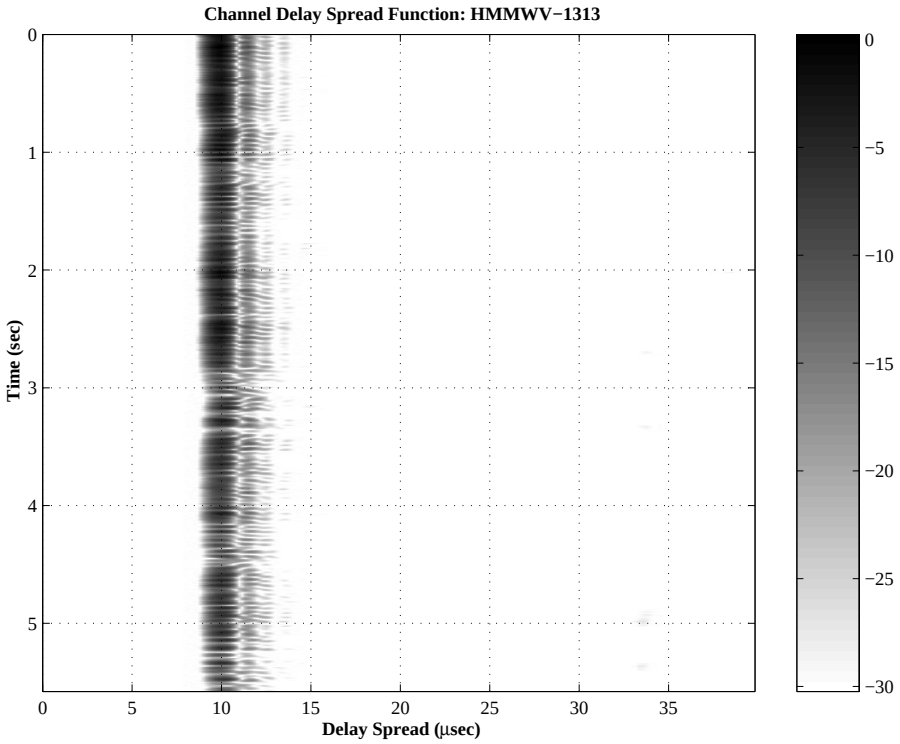

Figure 2.17: Channel delay spread function for hmmwv1313.

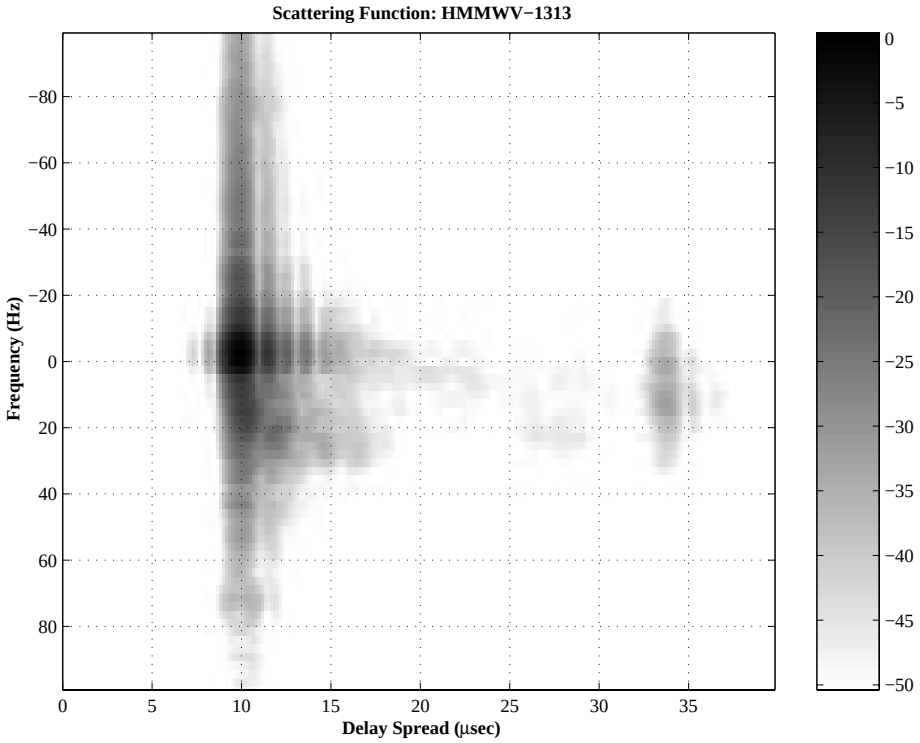

Figure 2.18: Scattering function for hmmwv1313.

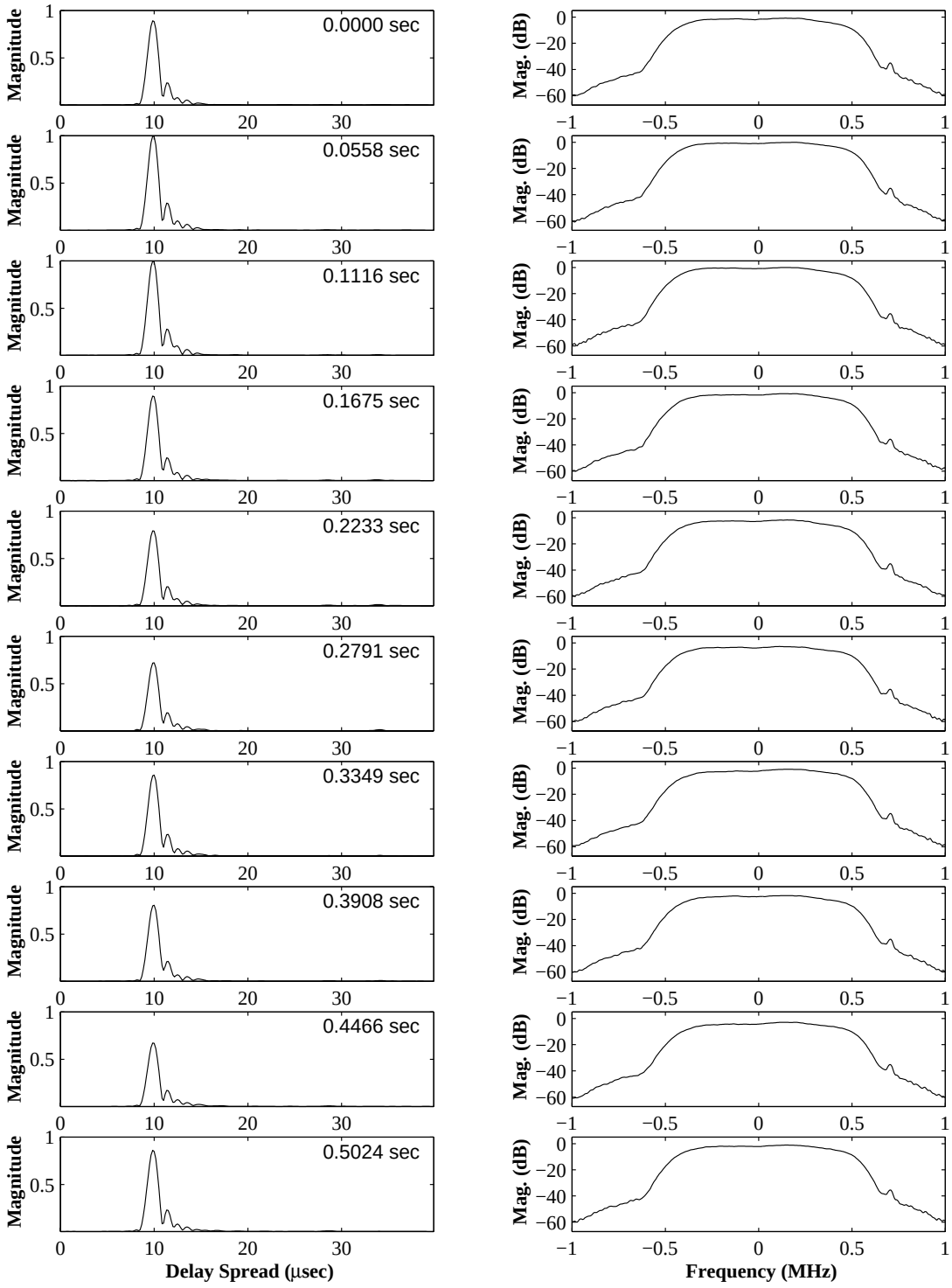

Figure 2.19: Local power delay profiles for hmmwv1313 (1).

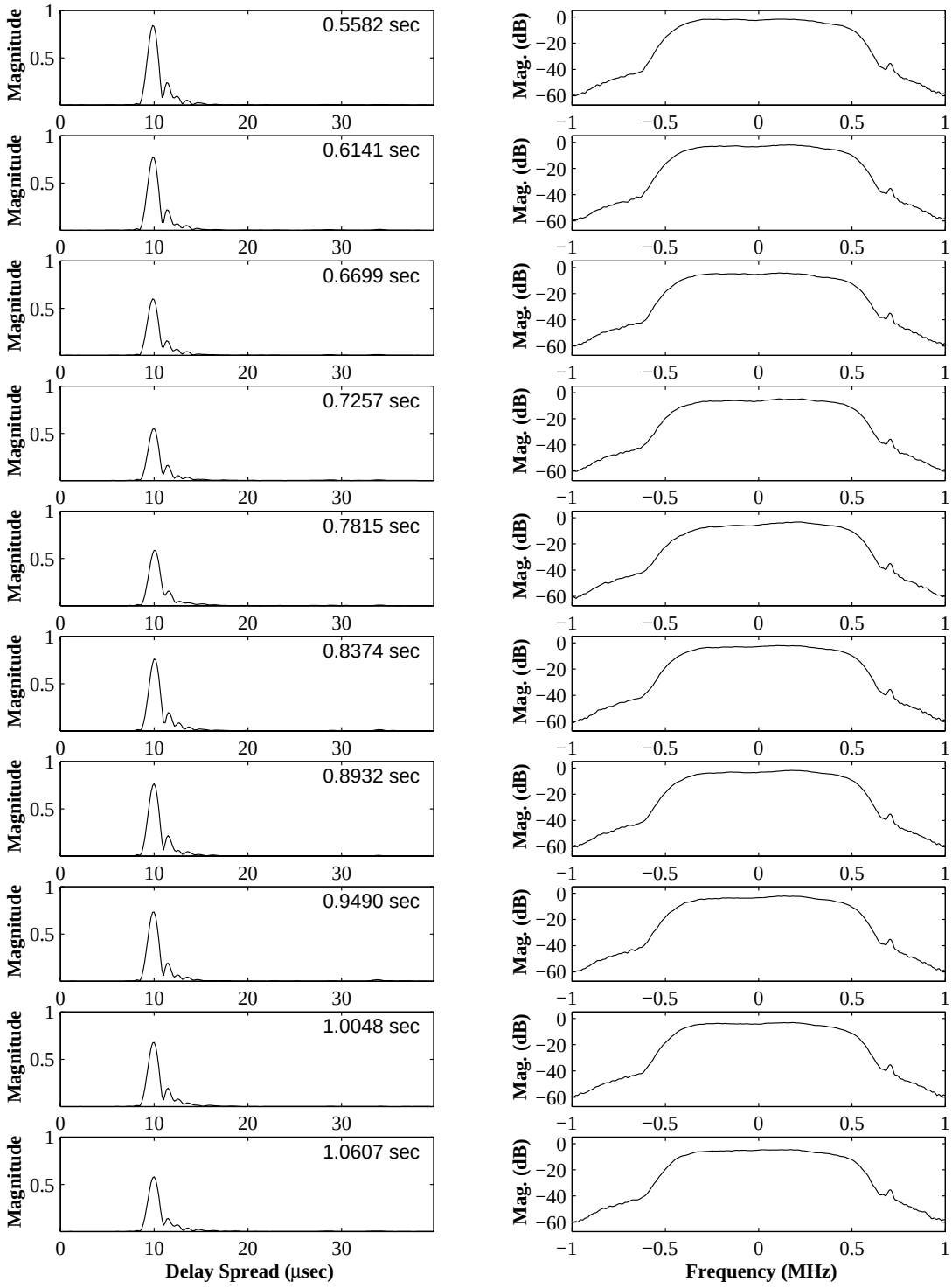

Figure 2.20: Local power delay profiles for hmmwv1313 (2).

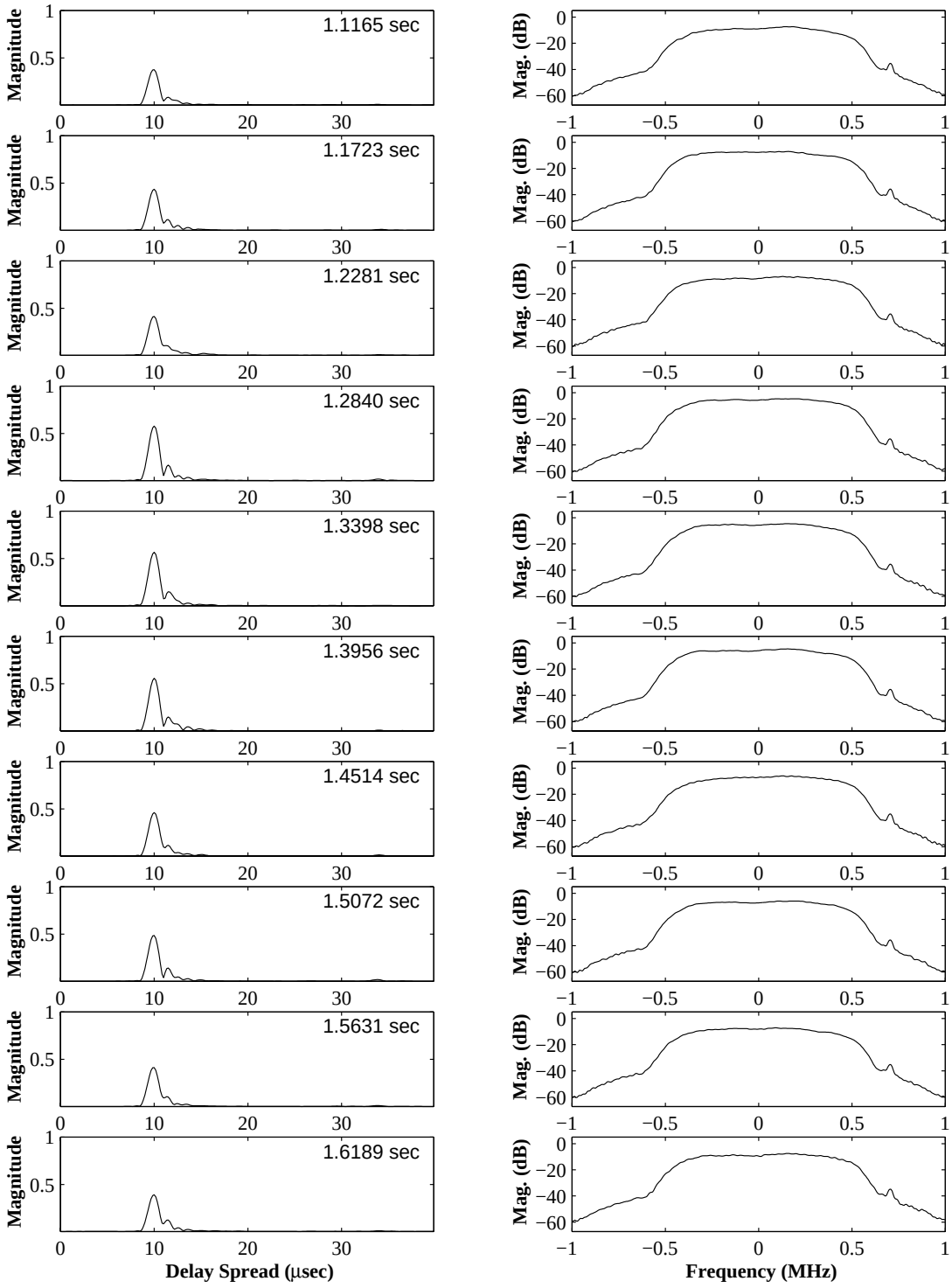

Figure 2.21: Local power delay profiles for hmmwv1313 (3).

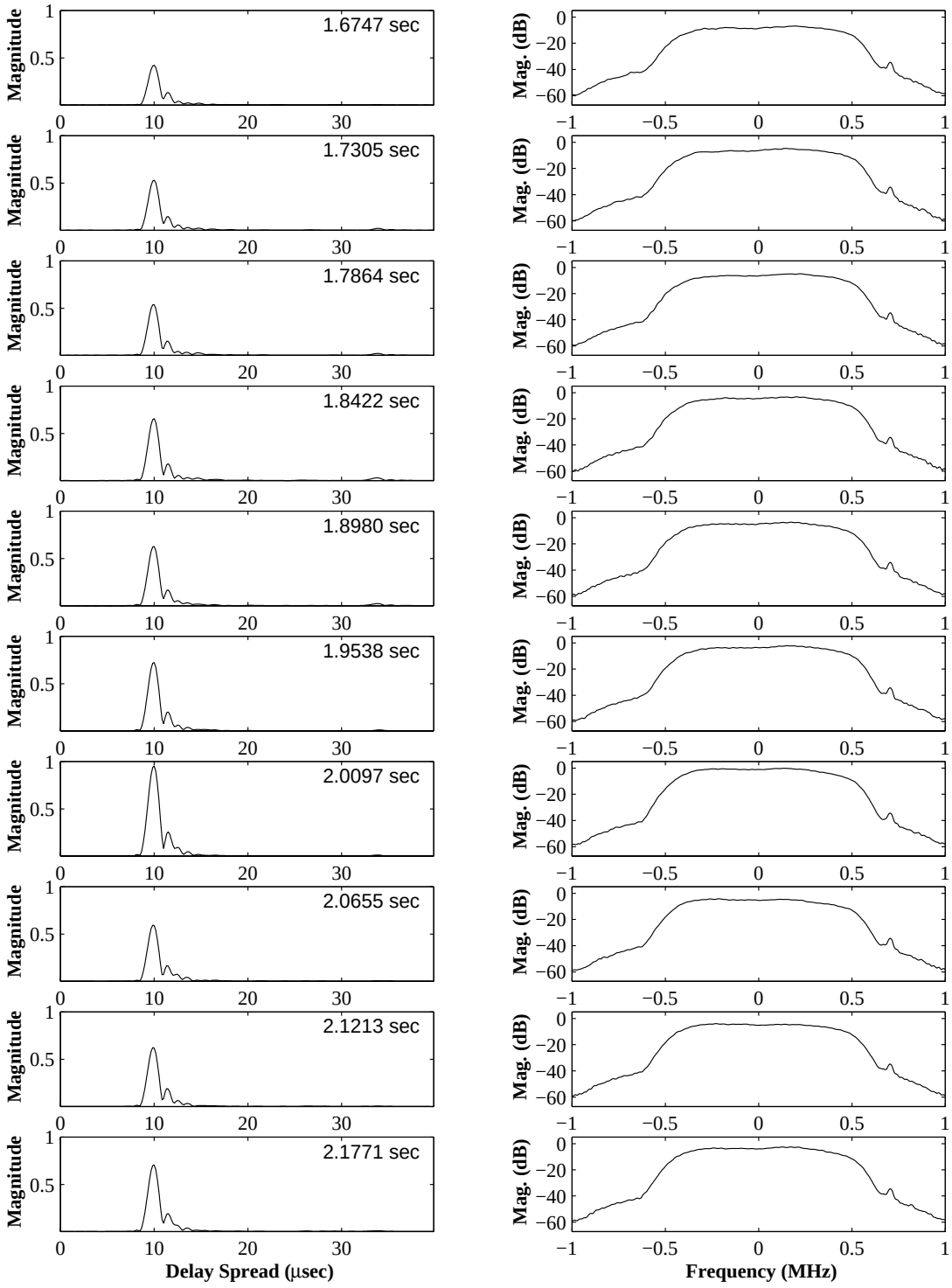

Figure 2.22: Local power delay profiles for hmmwv1313 (4).

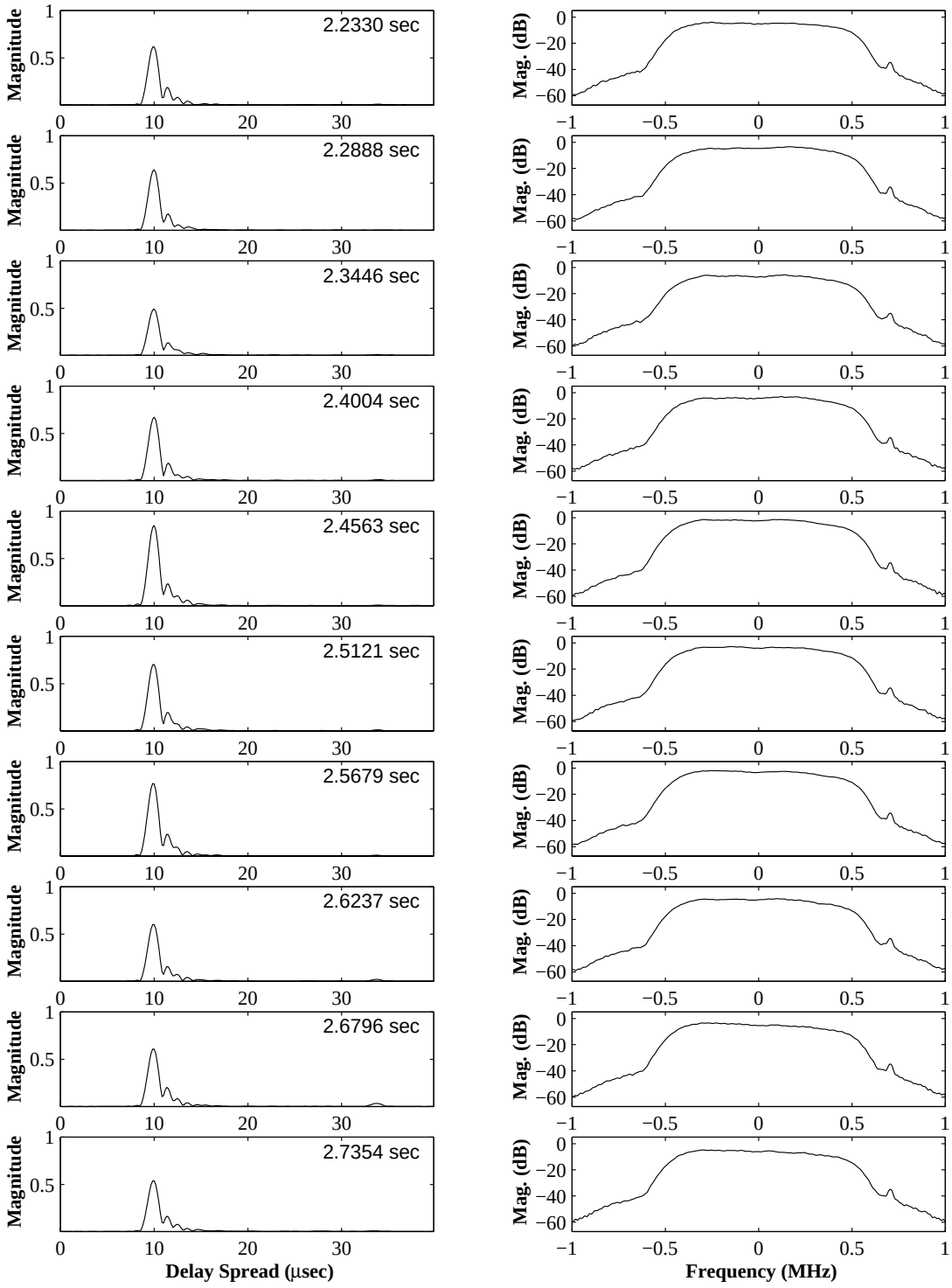

Figure 2.23: Local power delay profiles for hmmwv1313 (5).

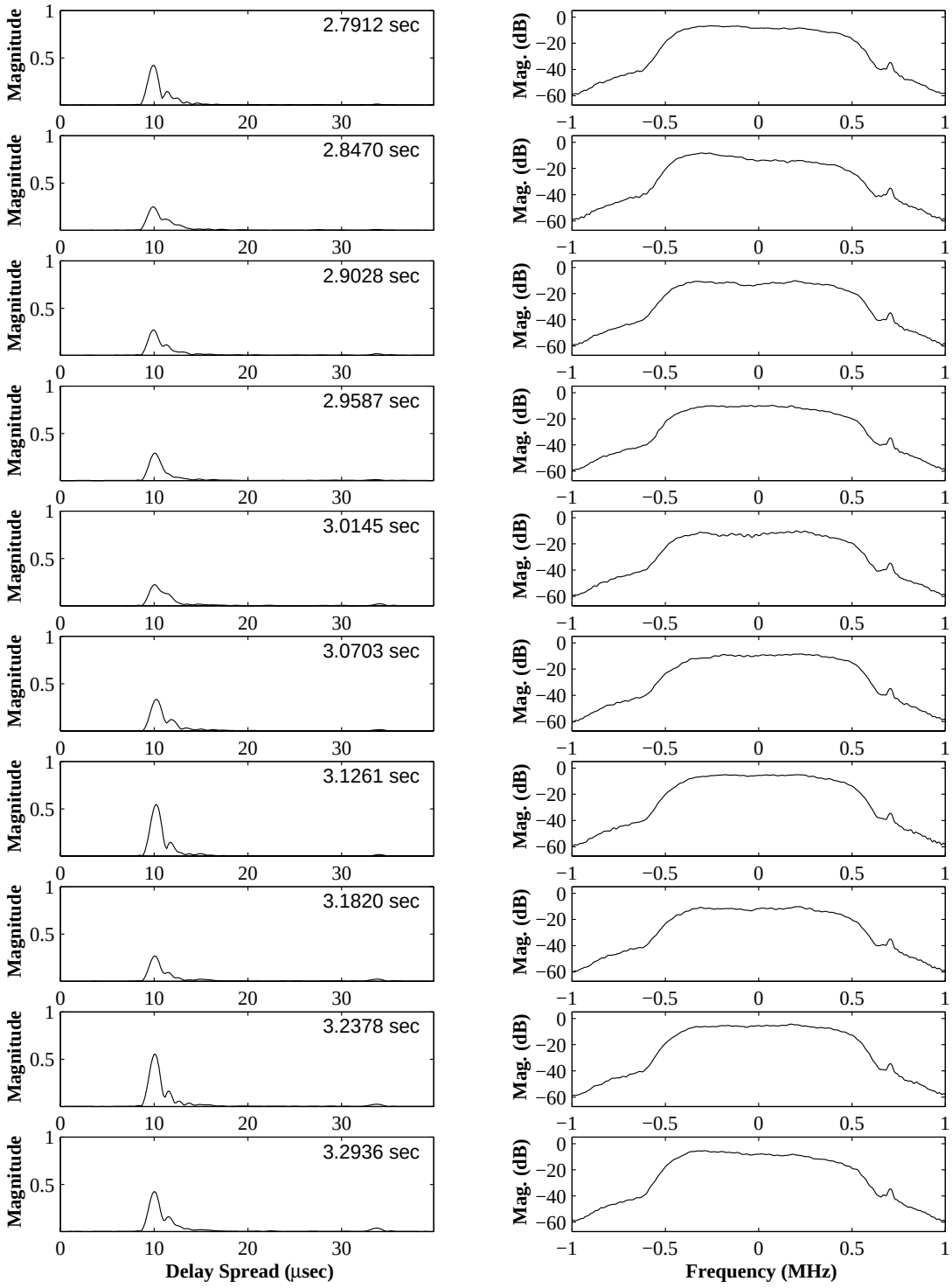

Figure 2.24: Local power delay profiles for hmmwv1313 (6).

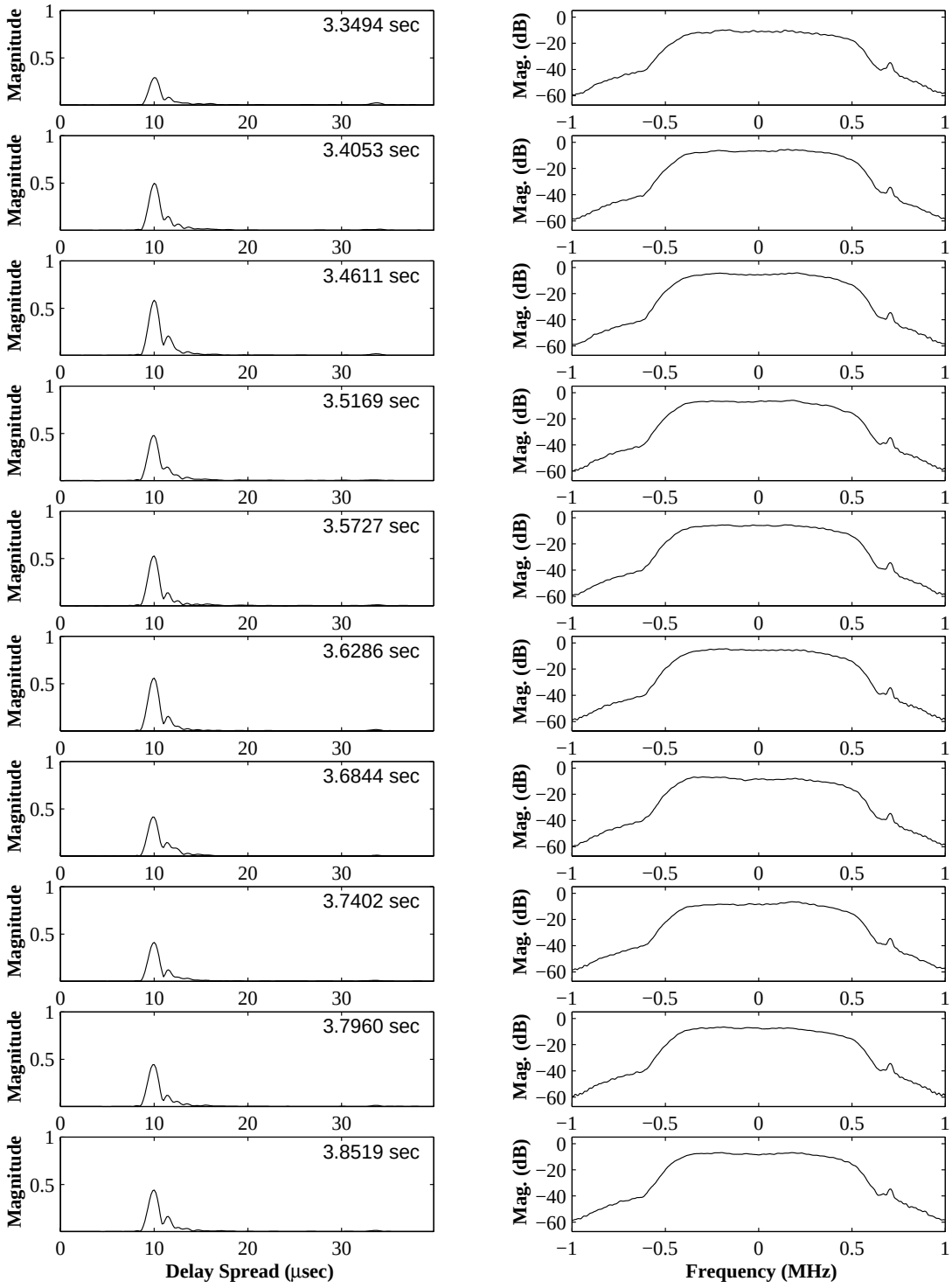

Figure 2.25: Local power delay profiles for hmmwv1313 (7).

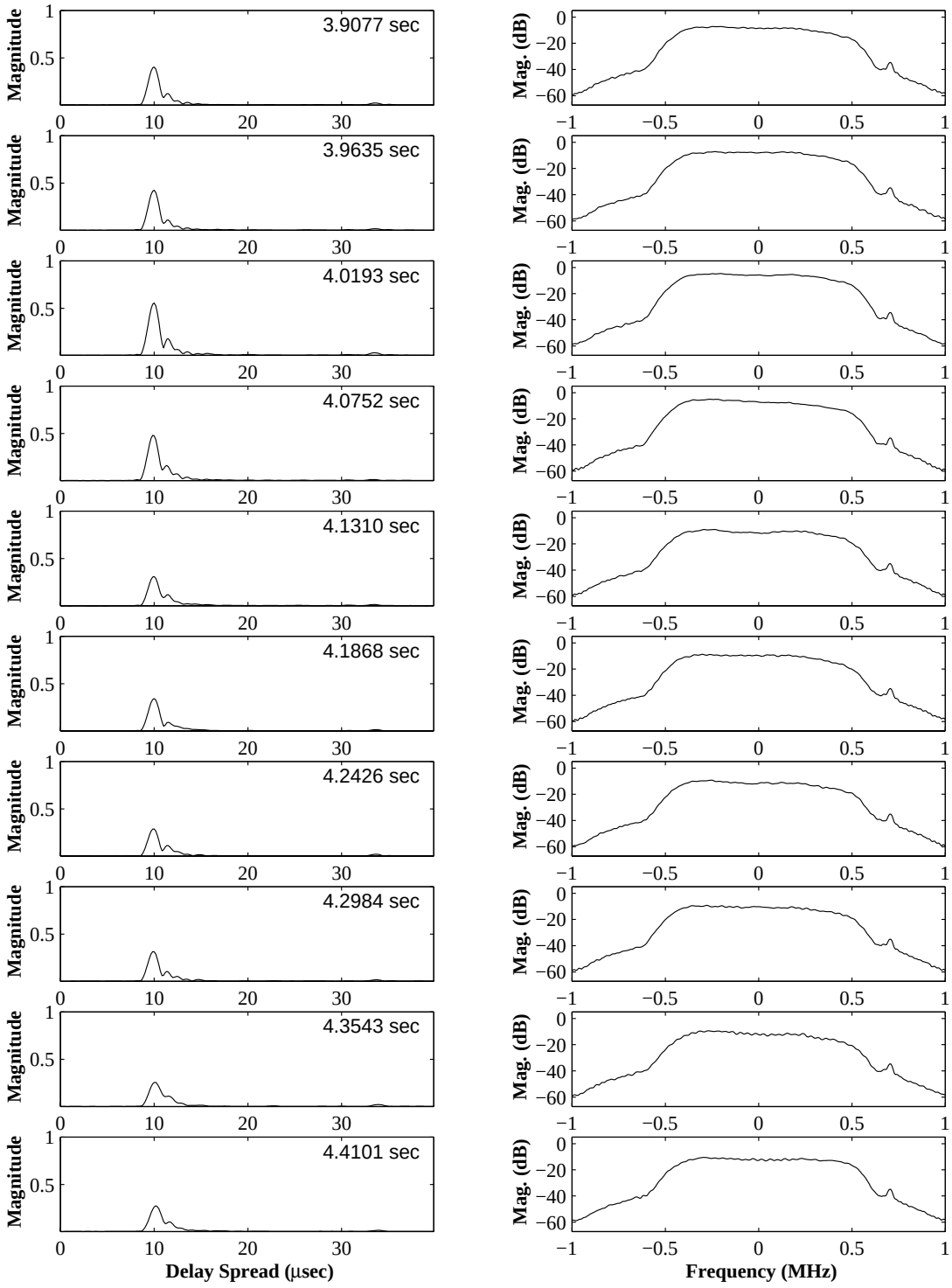

Figure 2.26: Local power delay profiles for hmmwv1313 (8).

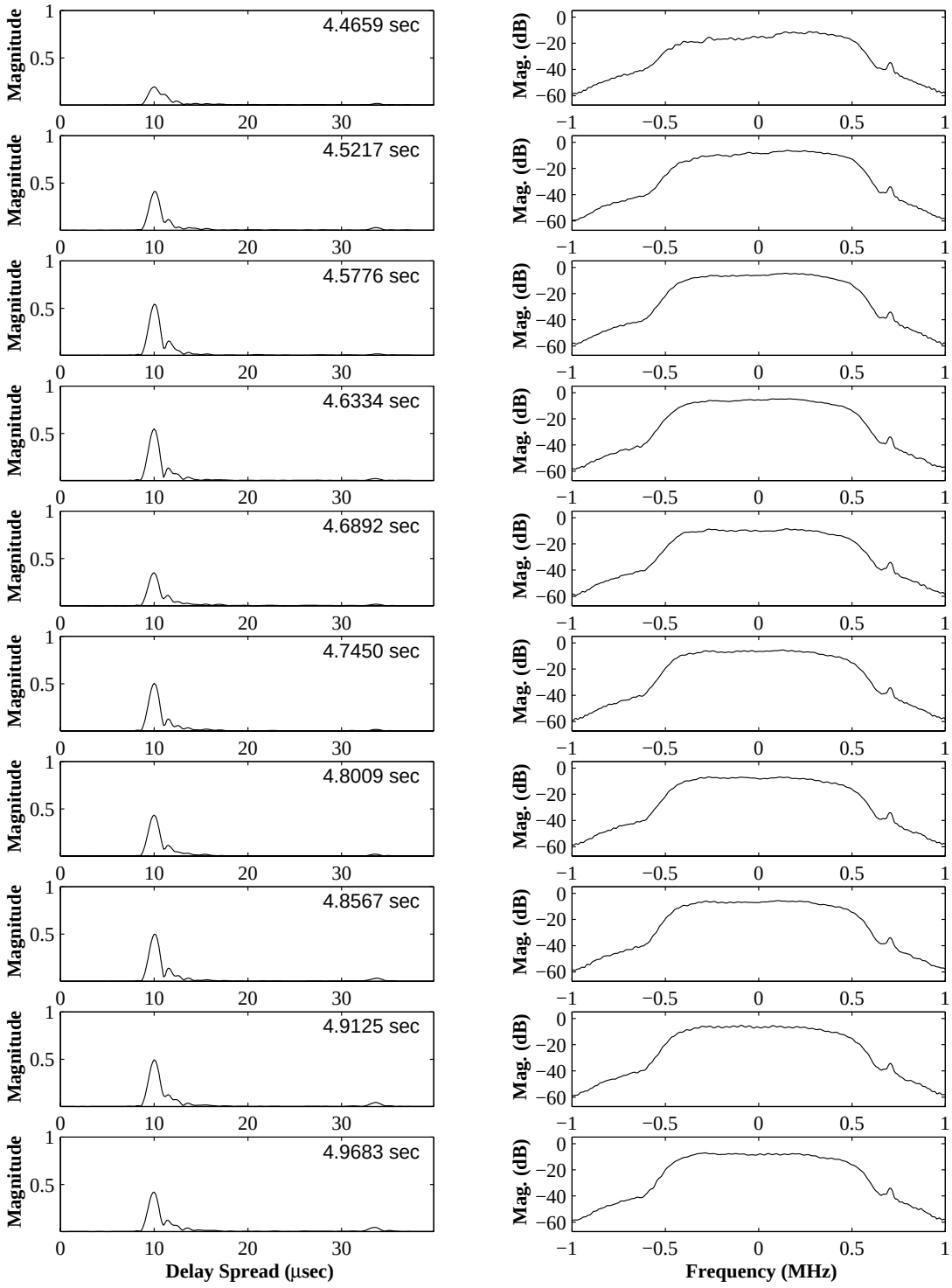

Figure 2.27: Local power delay profiles for hmmwv1313 (9).

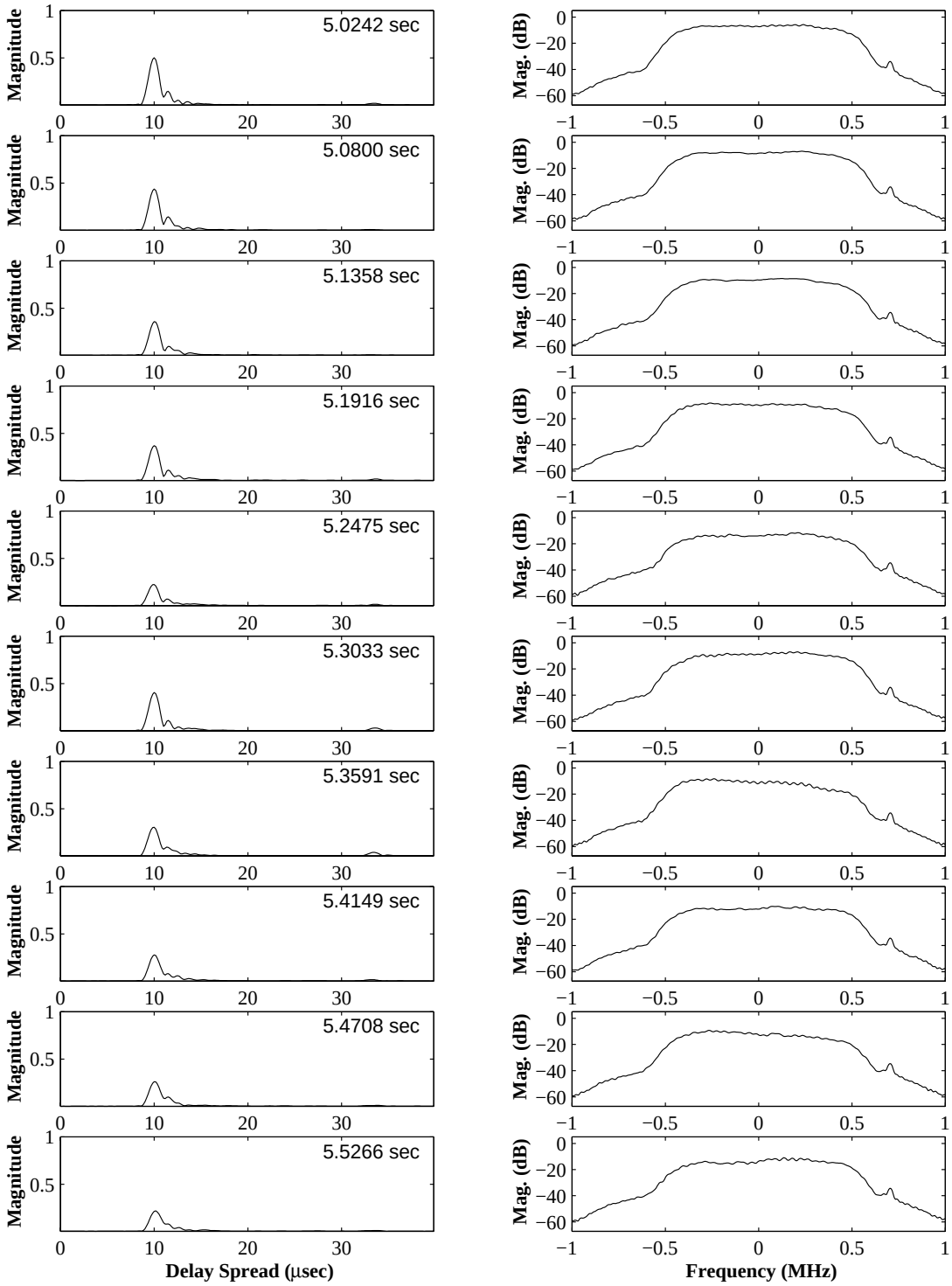

Figure 2.28: Local power delay profiles for hmmwv1313 (10).

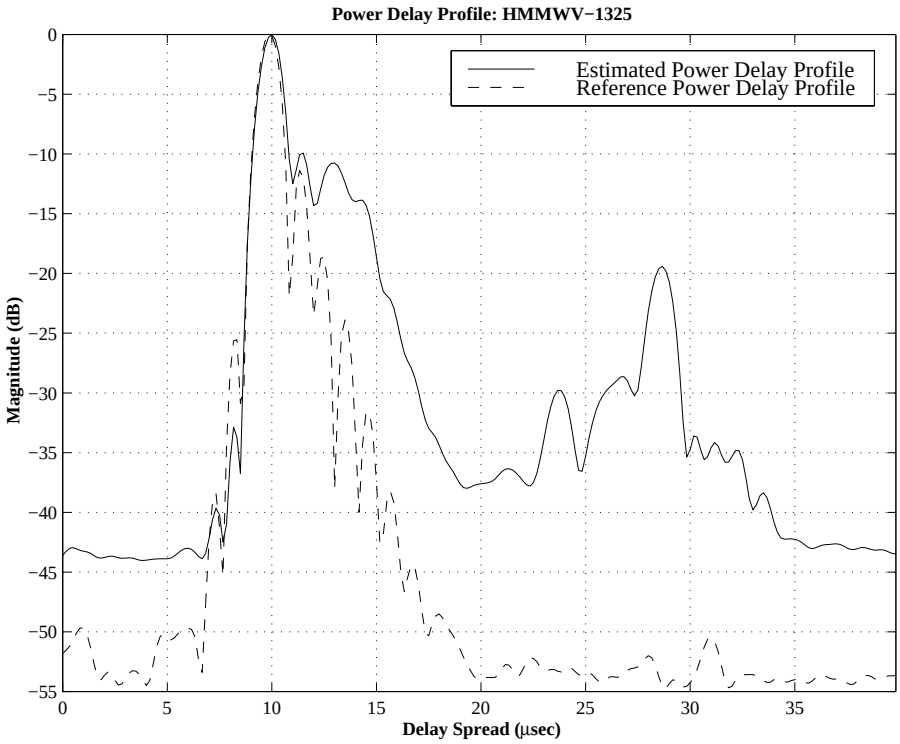

Figure 2.29: Power delay profile for hmmwv1325.

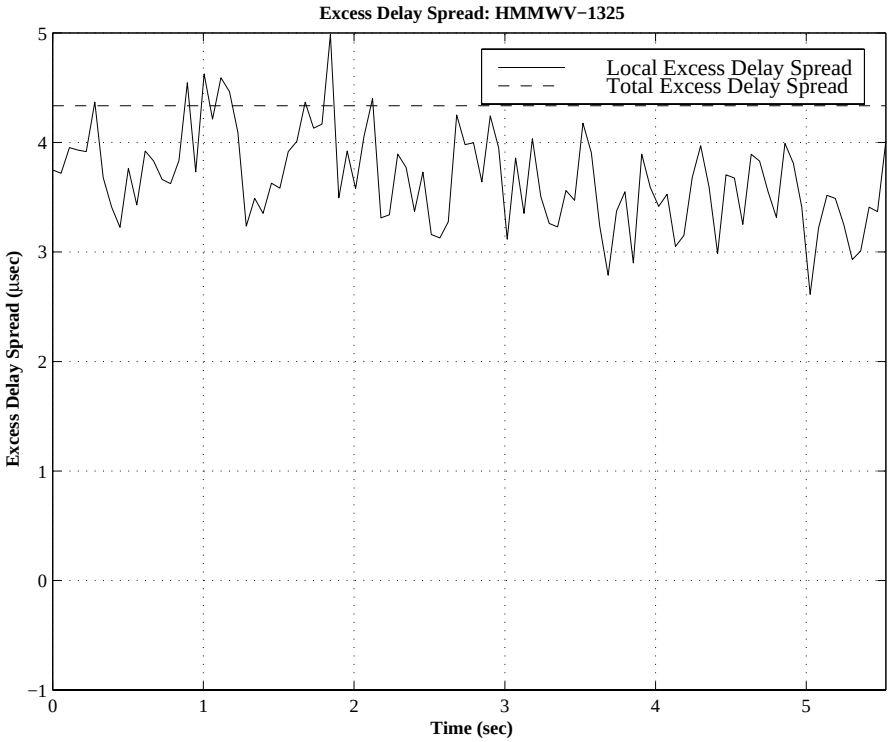

Figure 2.30: Excess delay spread for hmmwv1325.

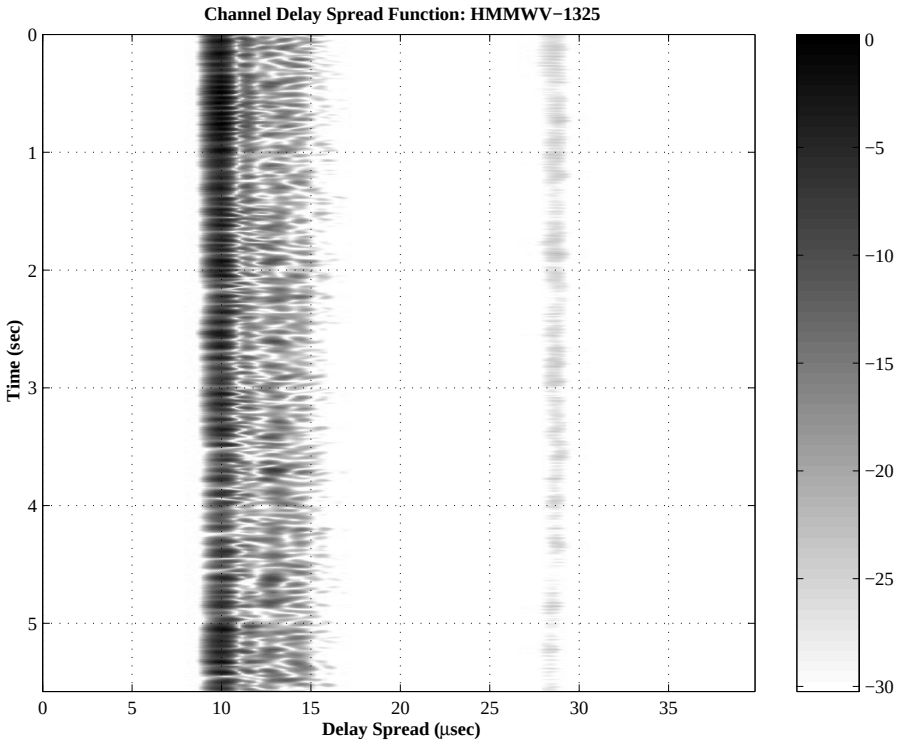

Figure 2.31: Channel delay spread function for hmmwv1325.

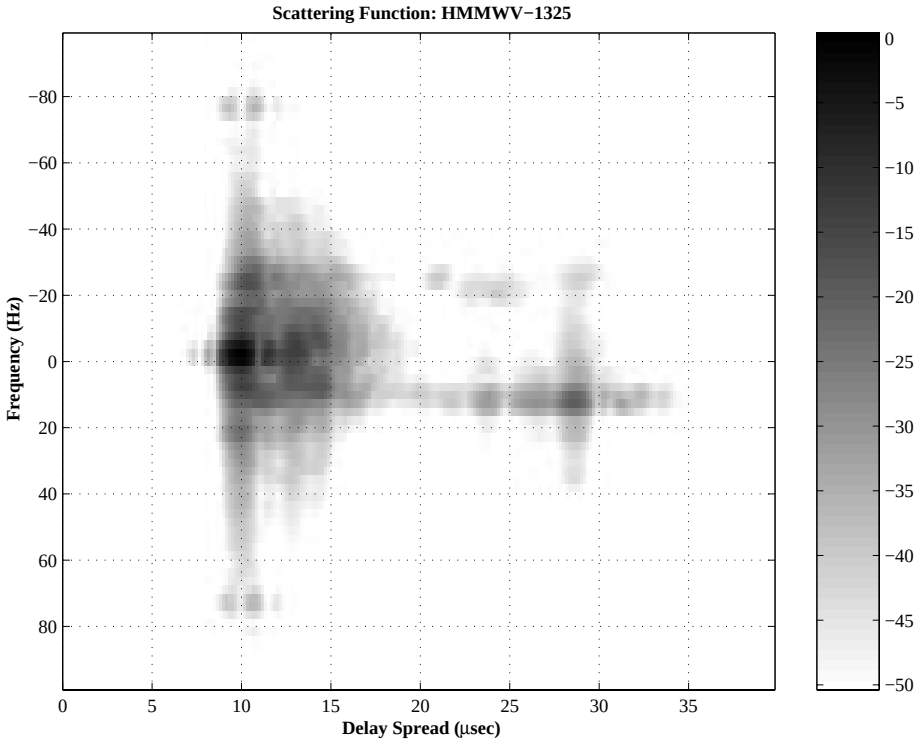

Figure 2.32: Scattering function for hmmwv1325.

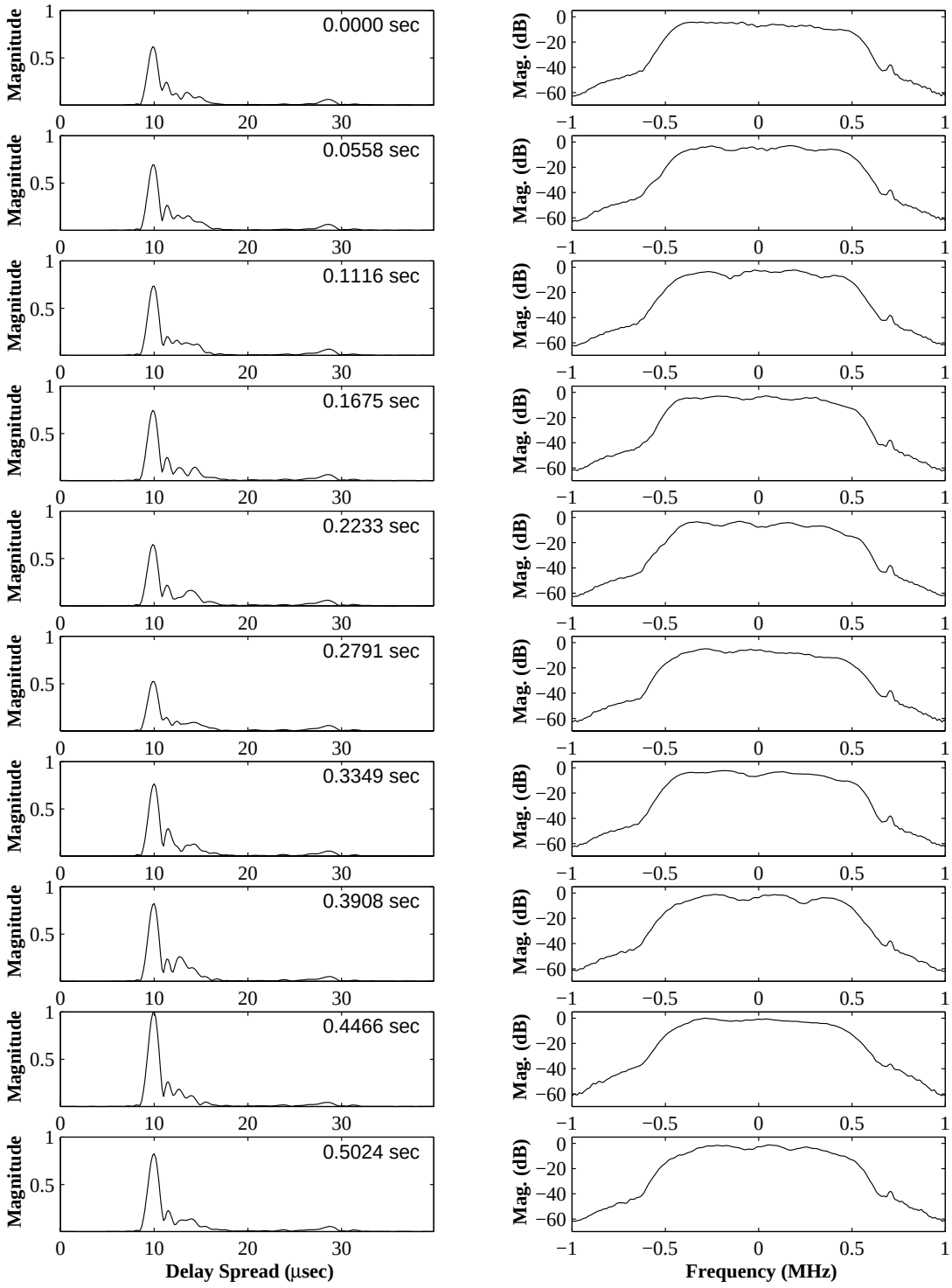

Figure 2.33: Local power delay profiles for hmmwv1325 (1).

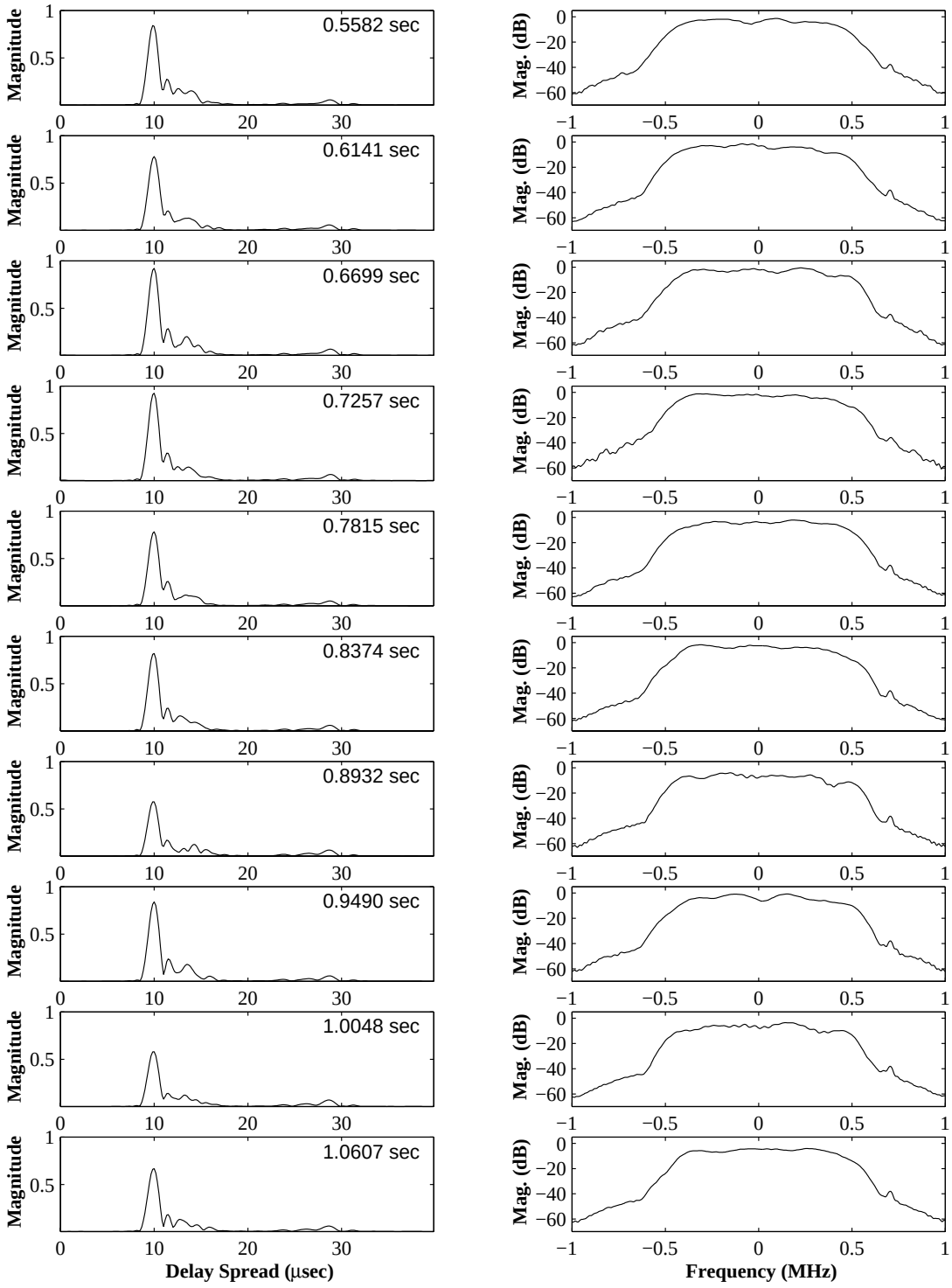

Figure 2.34: Local power delay profiles for hmmwv1325 (2).

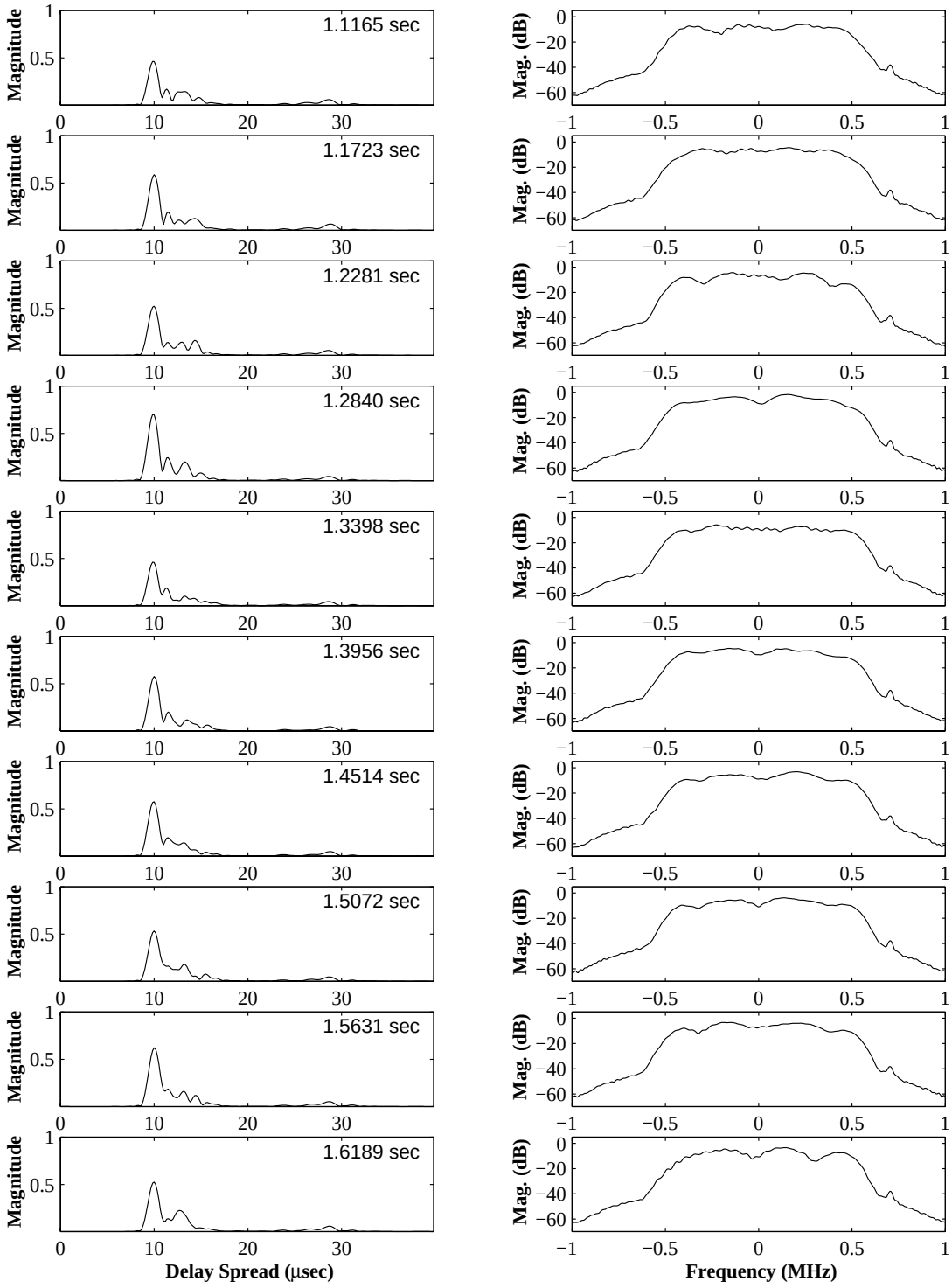

Figure 2.35: Local power delay profiles for hmmwv1325 (3).

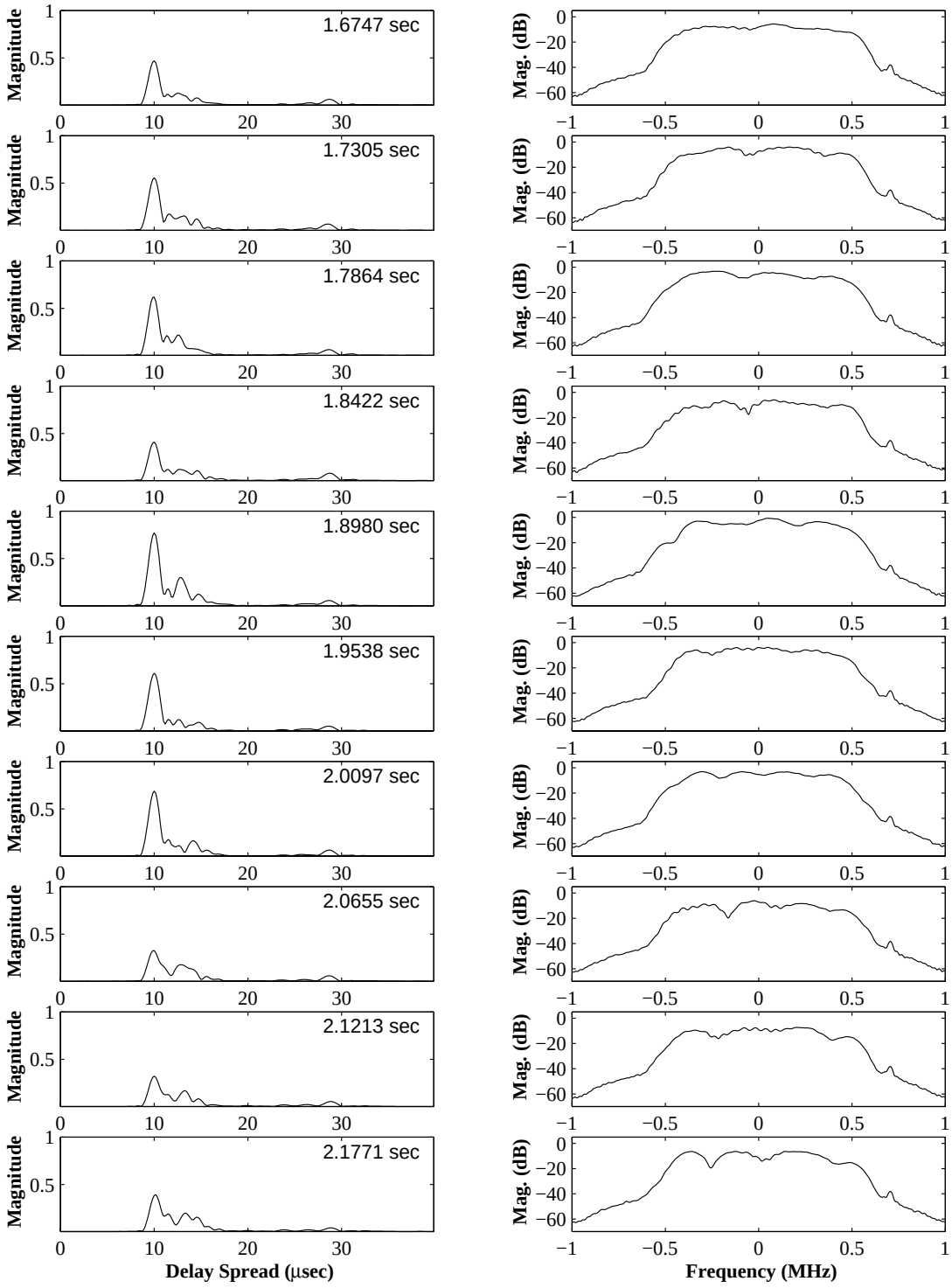

Figure 2.36: Local power delay profiles for hmmwv1325 (4).

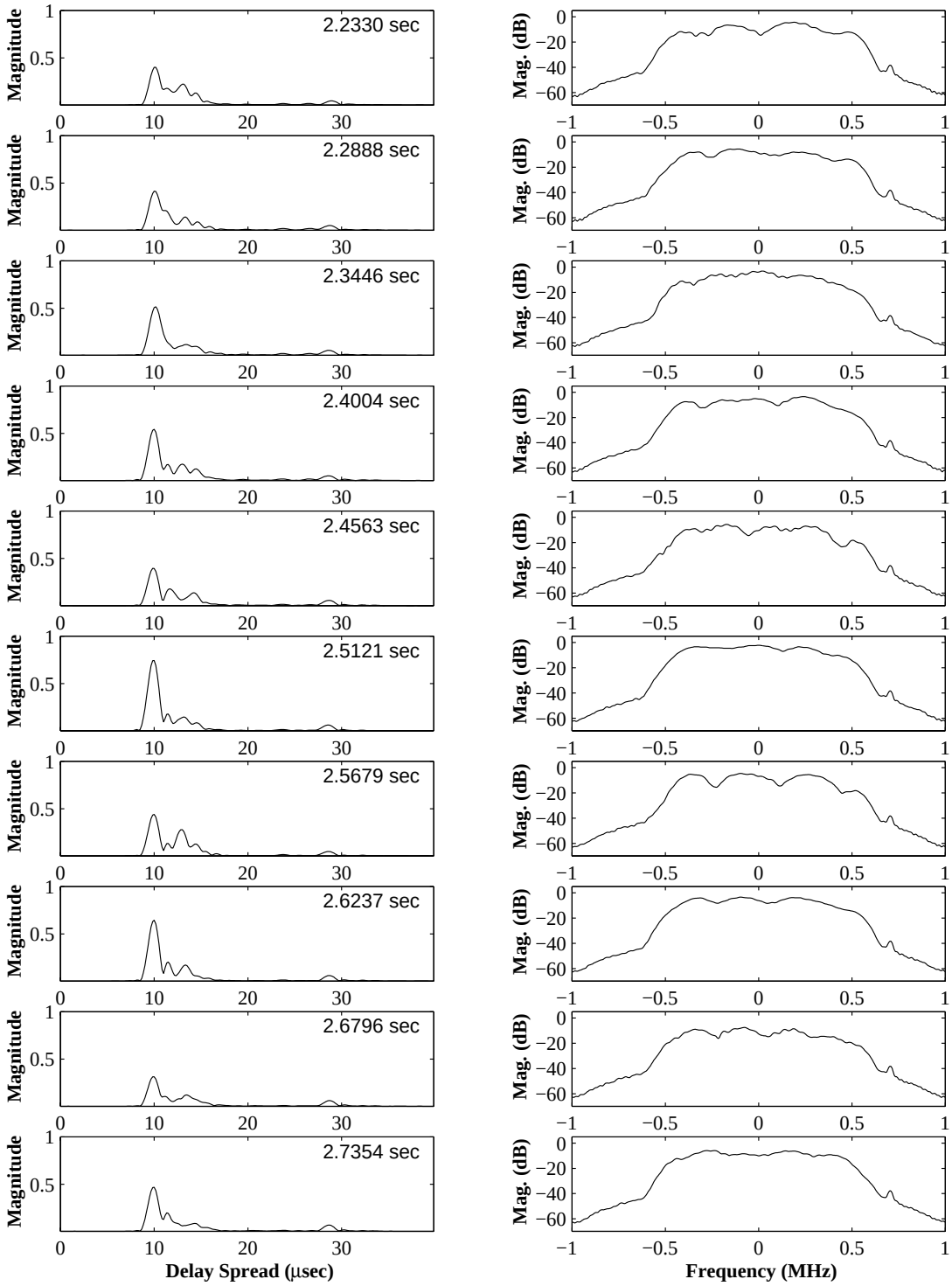

Figure 2.37: Local power delay profiles for hmmwv1325 (5).

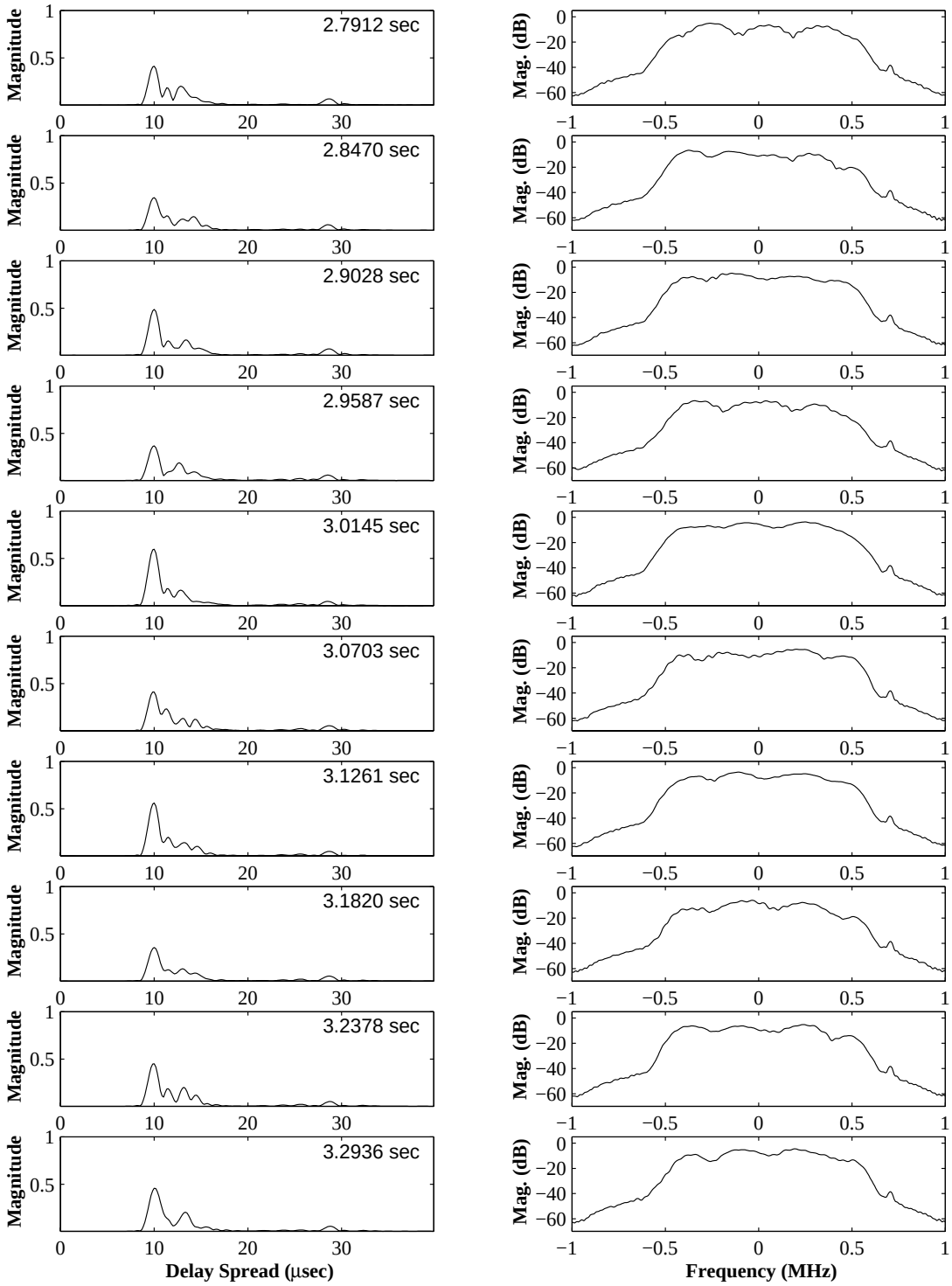

Figure 2.38: Local power delay profiles for hmmwv1325 (6).

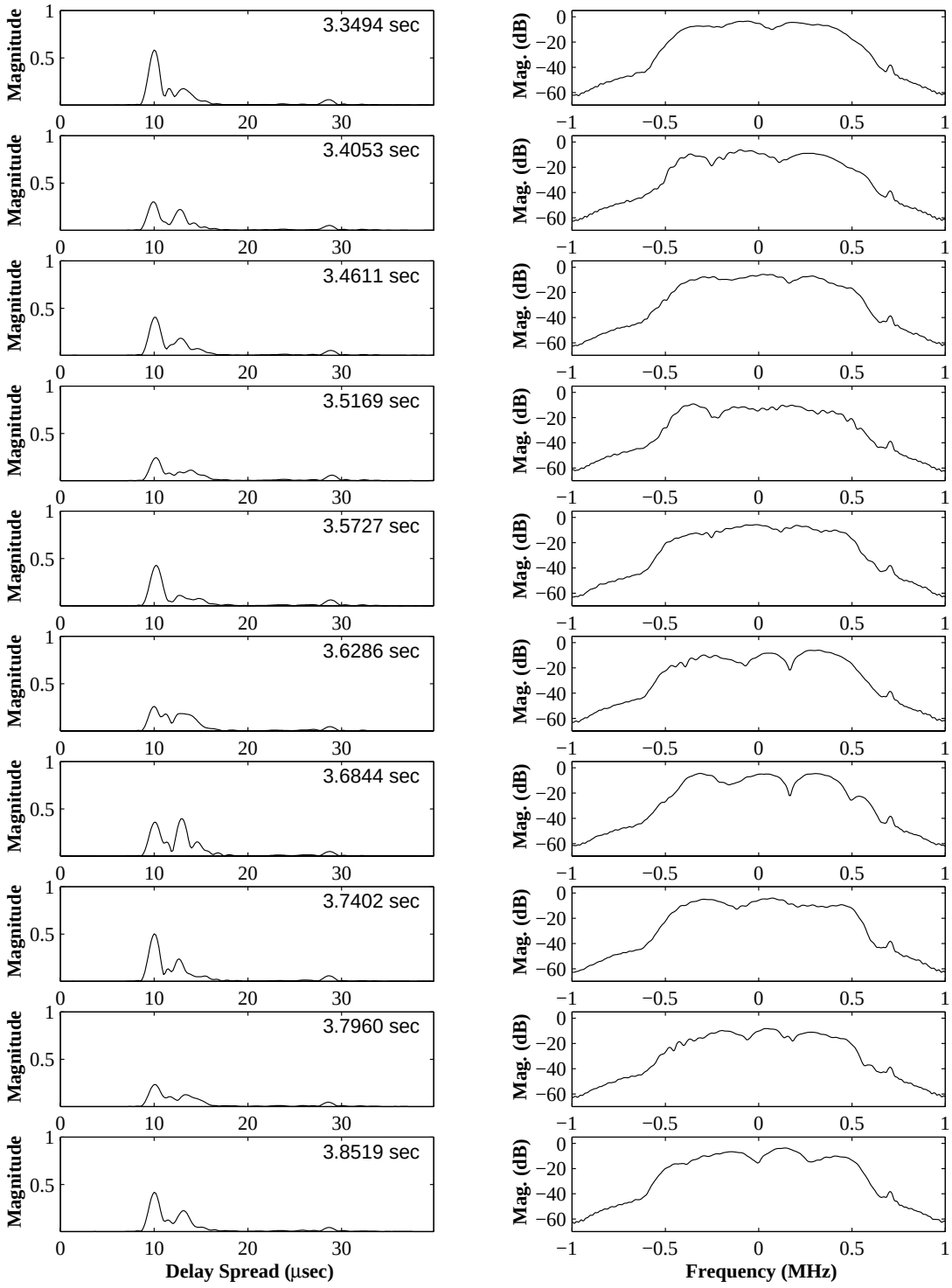

Figure 2.39: Local power delay profiles for hmmwv1325 (7).

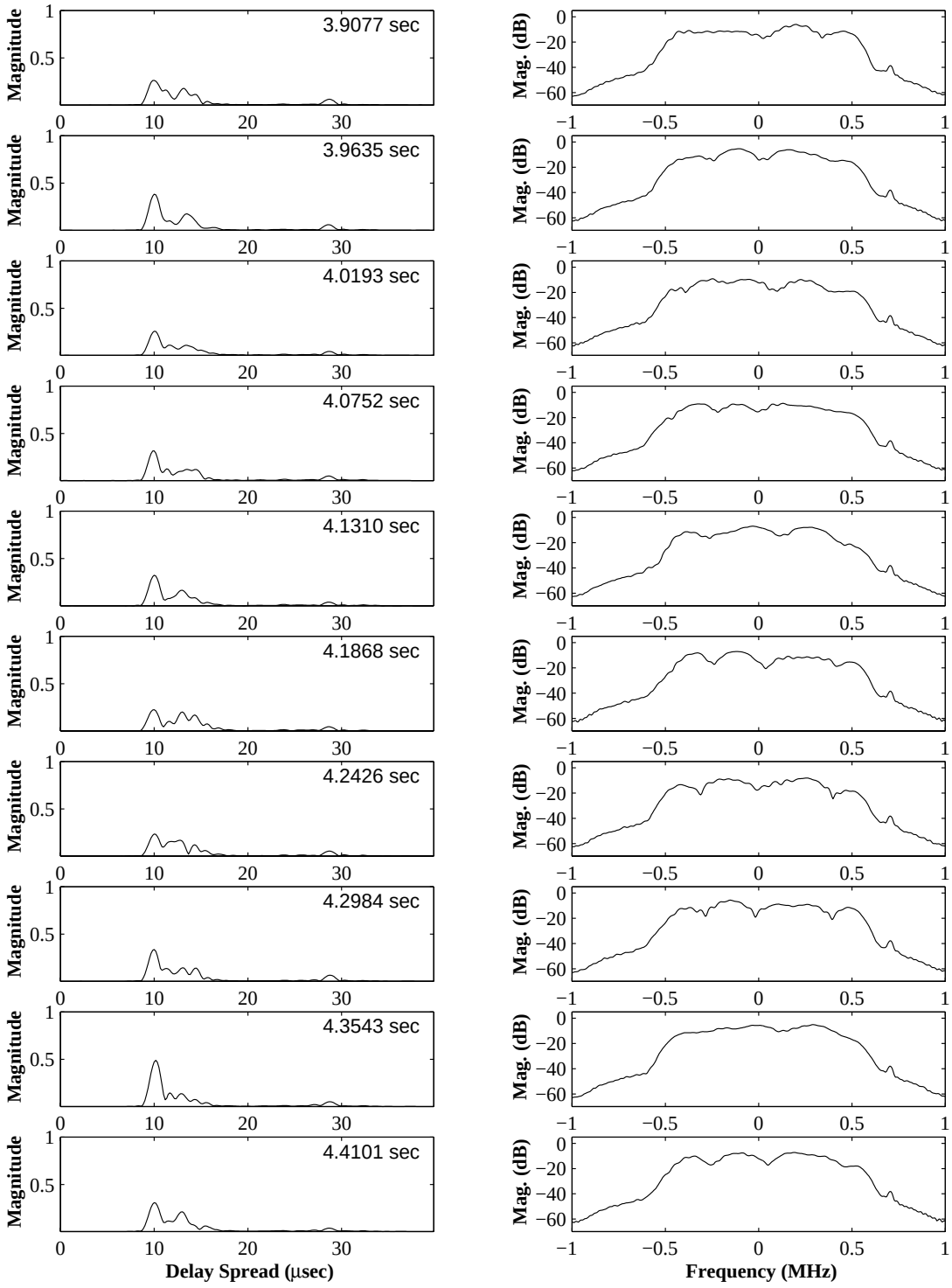

Figure 2.40: Local power delay profiles for hmmwv1325 (8).

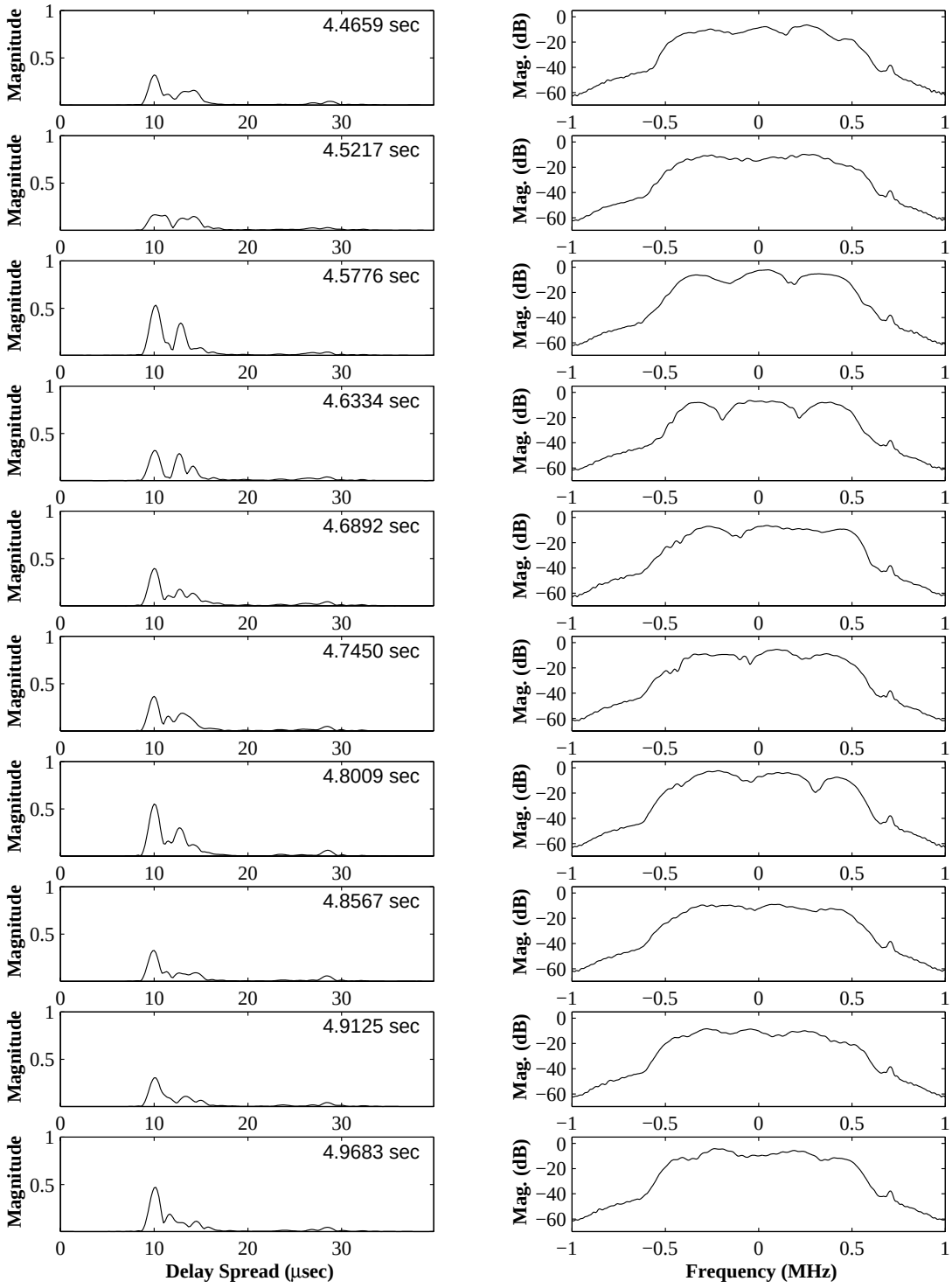

Figure 2.41: Local power delay profiles for hmmwv1325 (9).

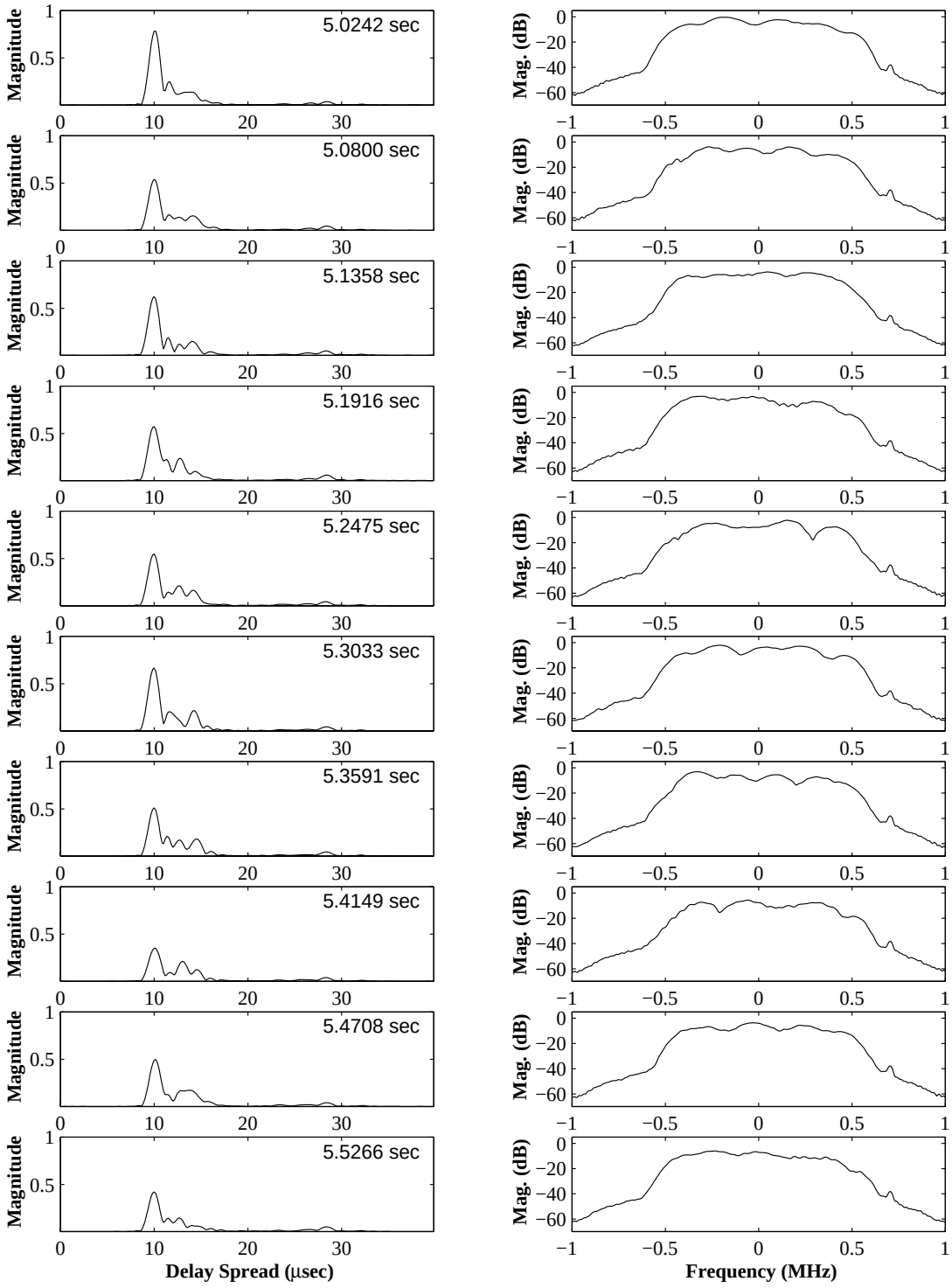

Figure 2.42: Local power delay profiles for hmmwv1325 (10).

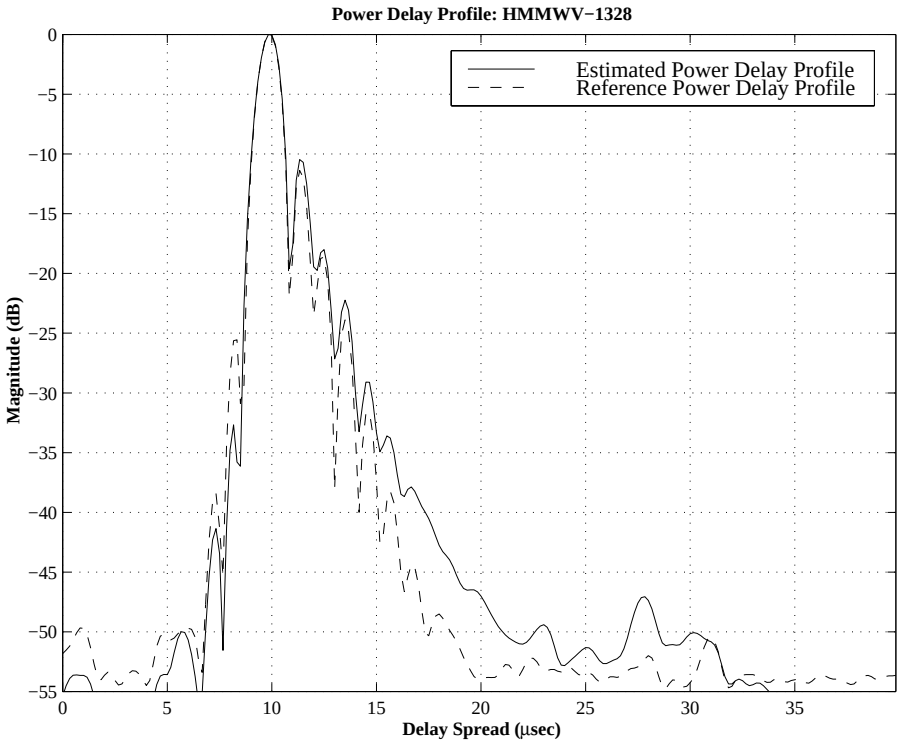

Figure 2.43: Power delay profile for hmmwv1328.

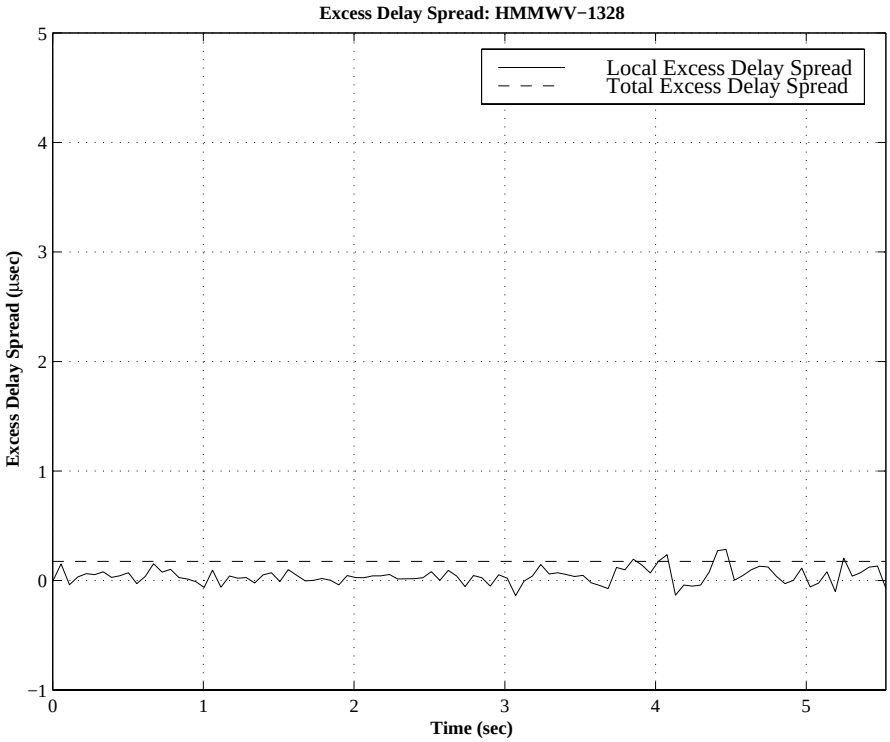

Figure 2.44: Excess delay spread for hmmwv1328.

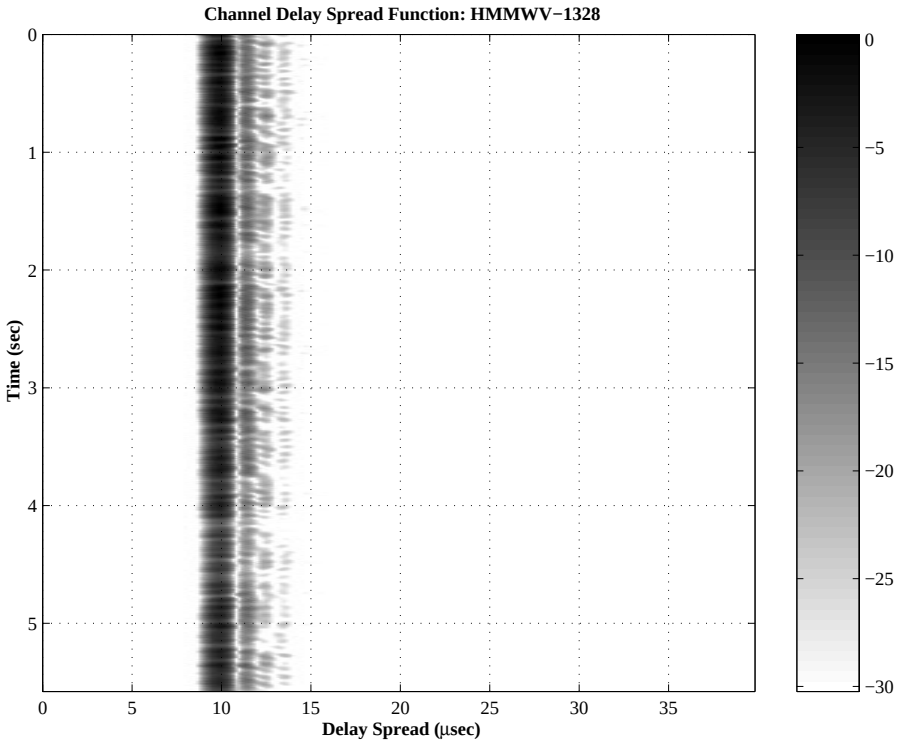

Figure 2.45: Channel delay spread function for hmmwv1328.

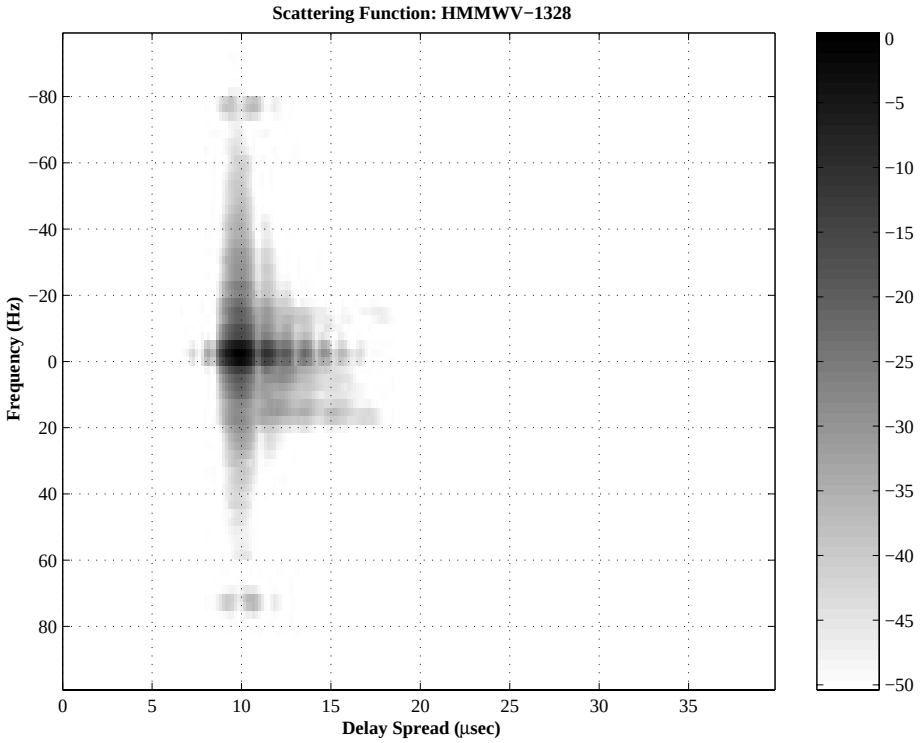

Figure 2.46: Scattering function for hmmwv1328.

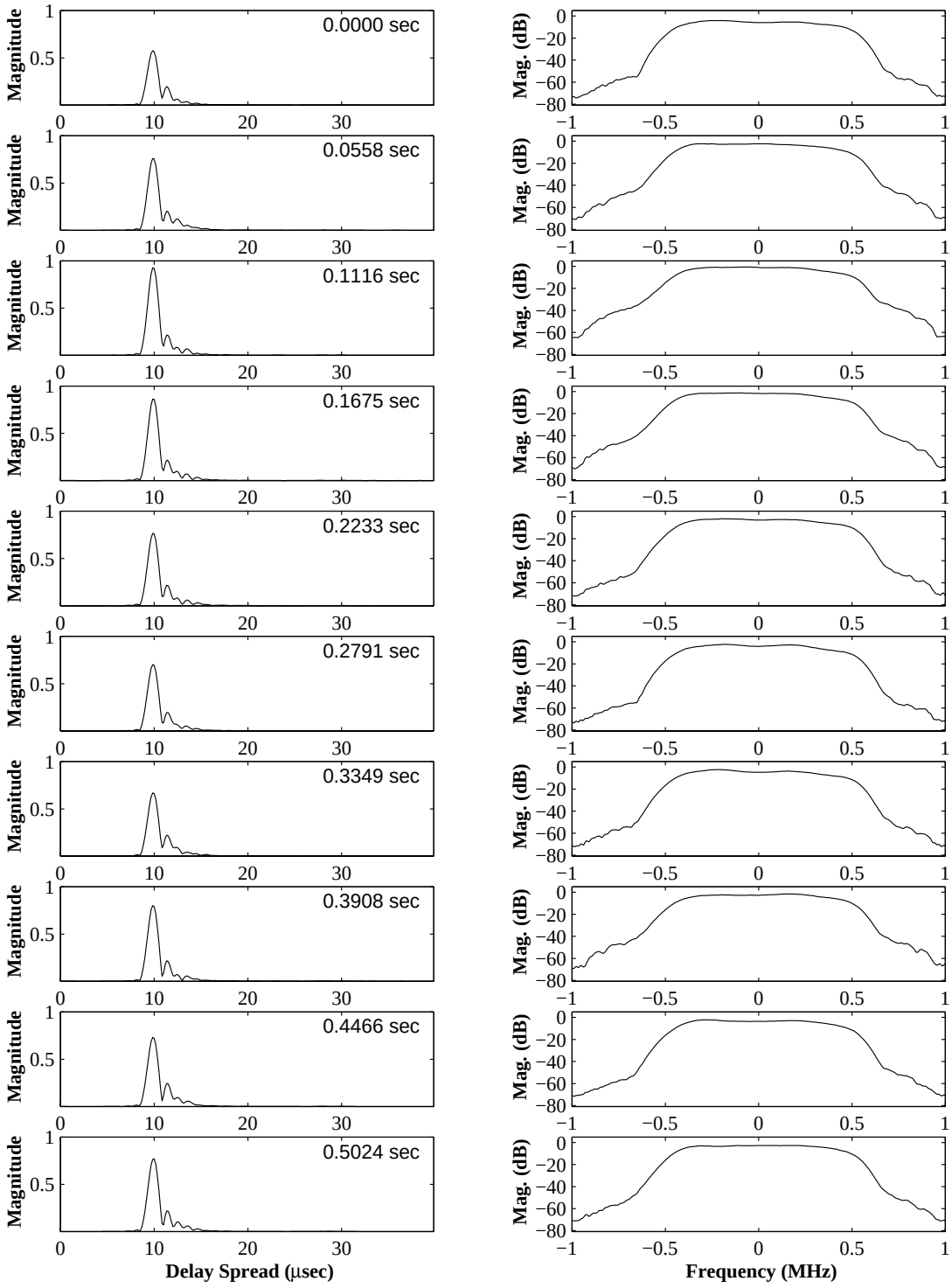

Figure 2.47: Local power delay profiles for hmmwv1328 (1).

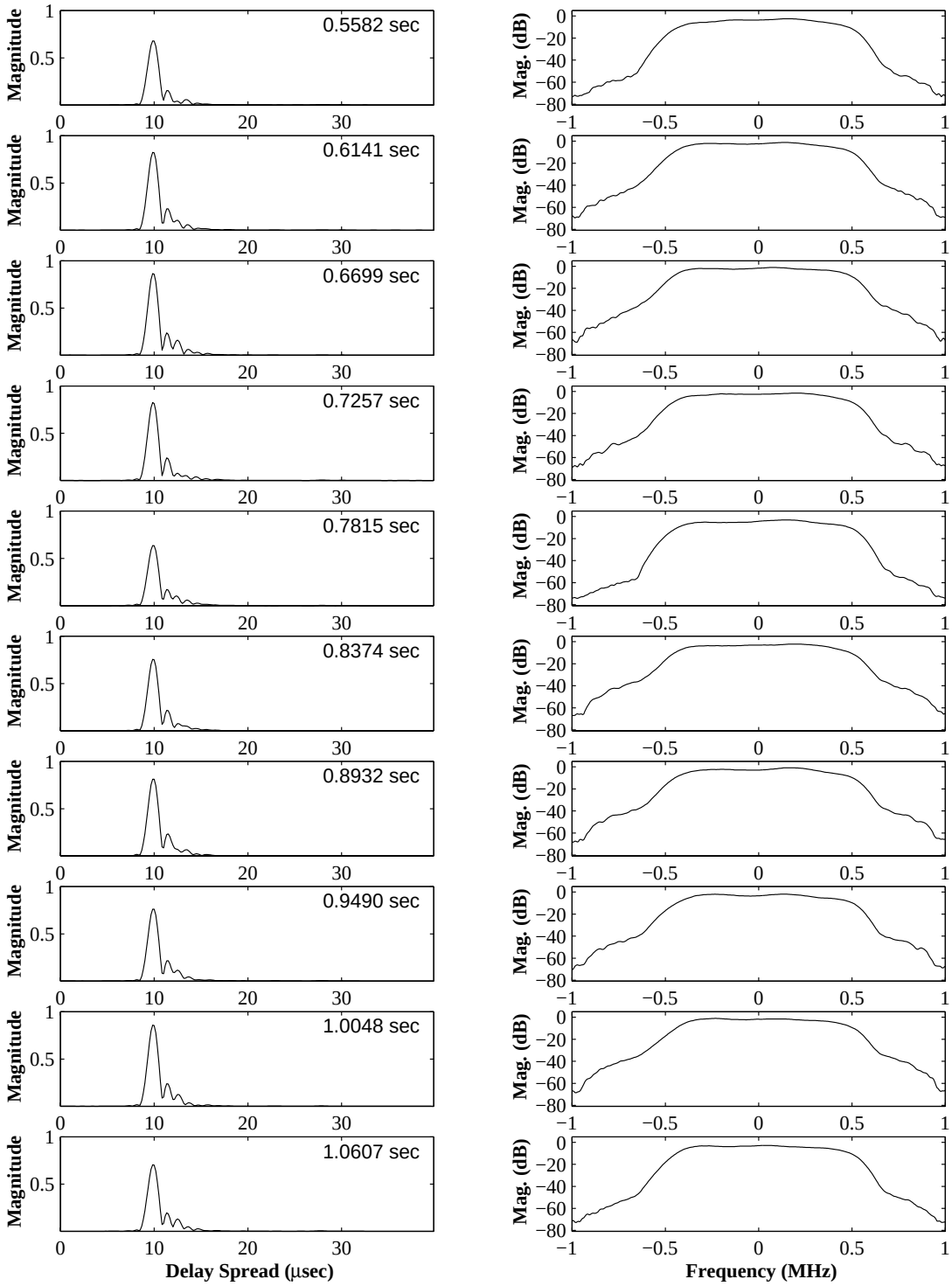

Figure 2.48: Local power delay profiles for hmmwv1328 (2).

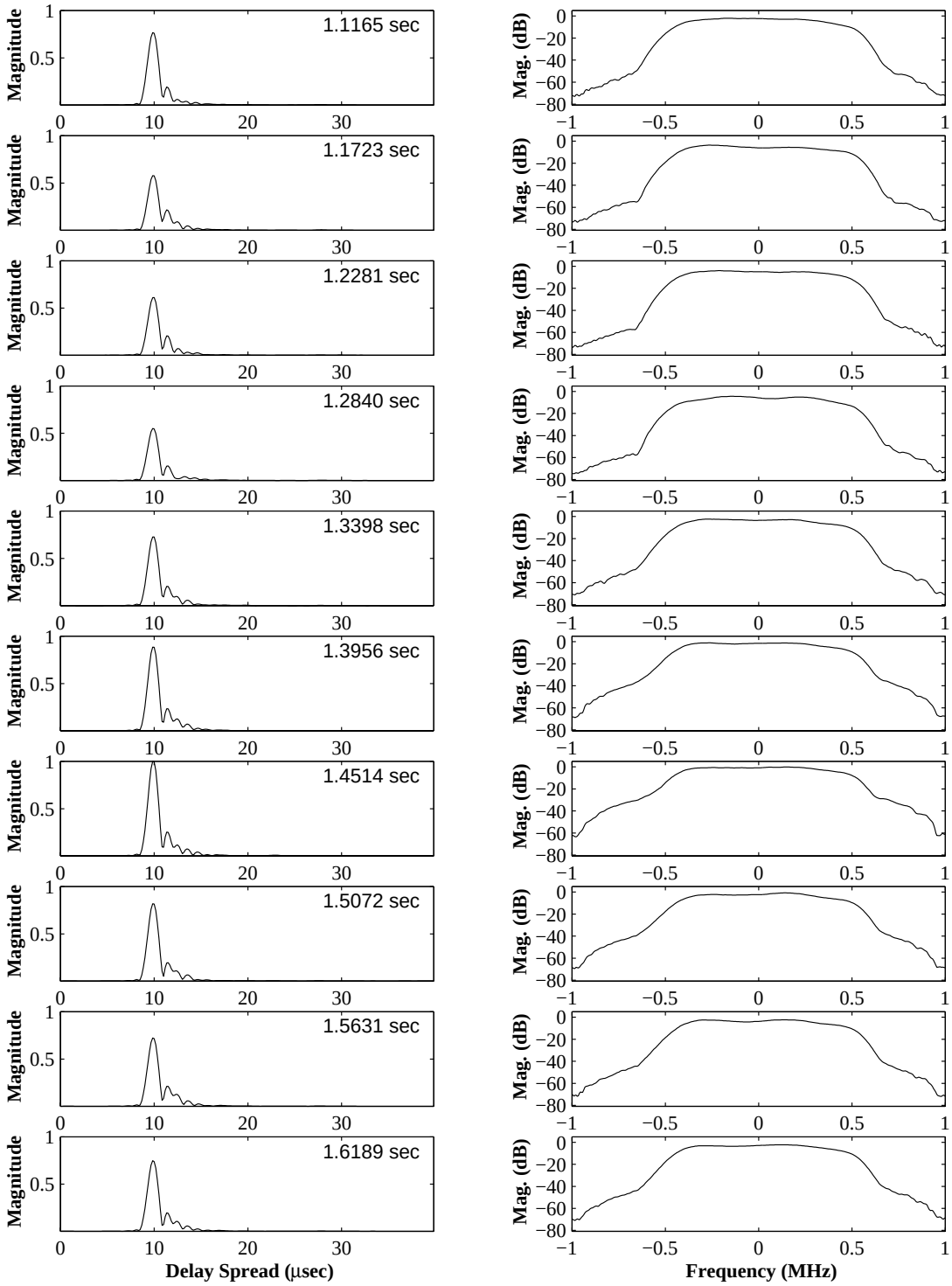

Figure 2.49: Local power delay profiles for hmmwv1328 (3).

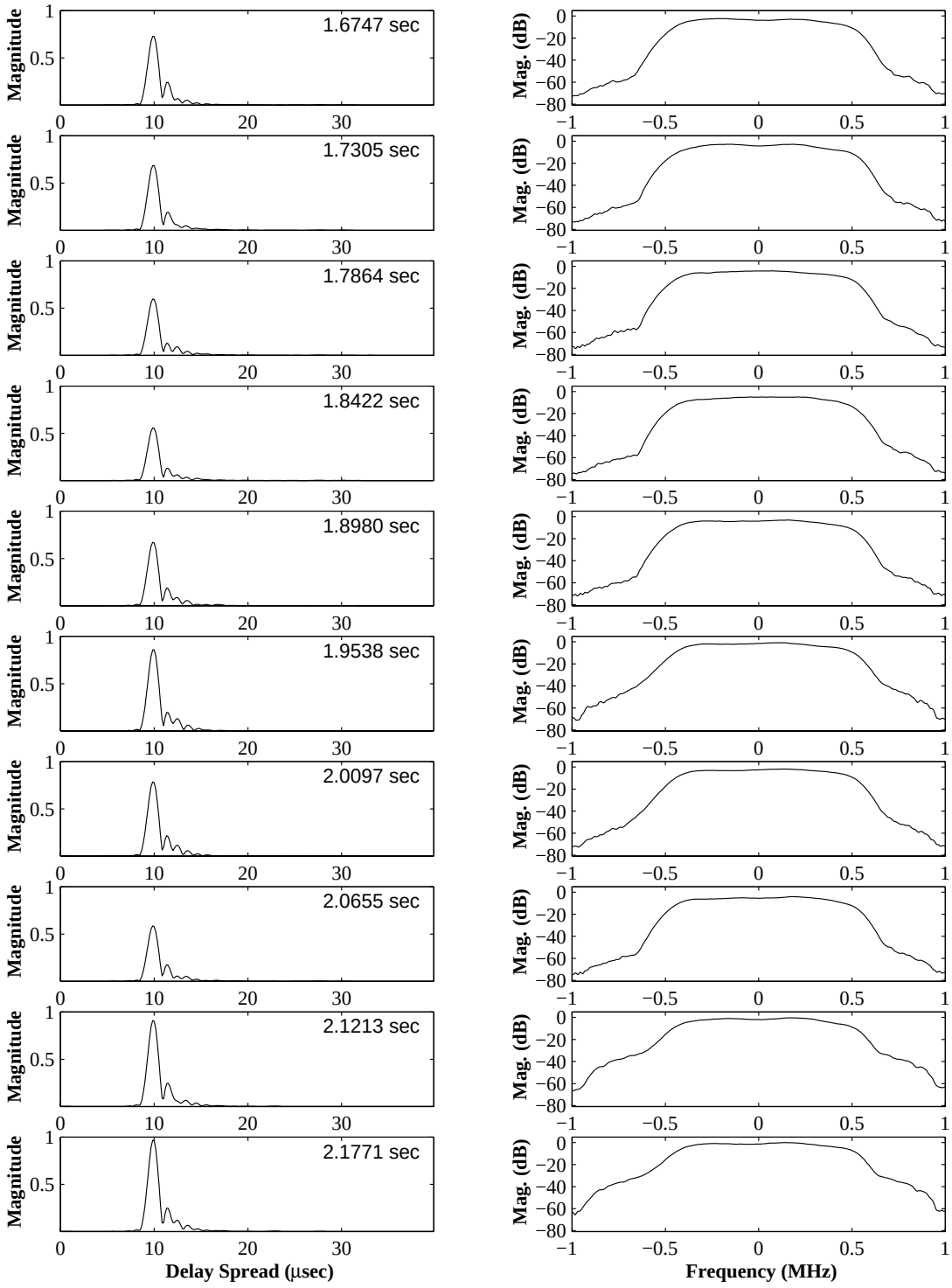

Figure 2.50: Local power delay profiles for hmmwv1328 (4).

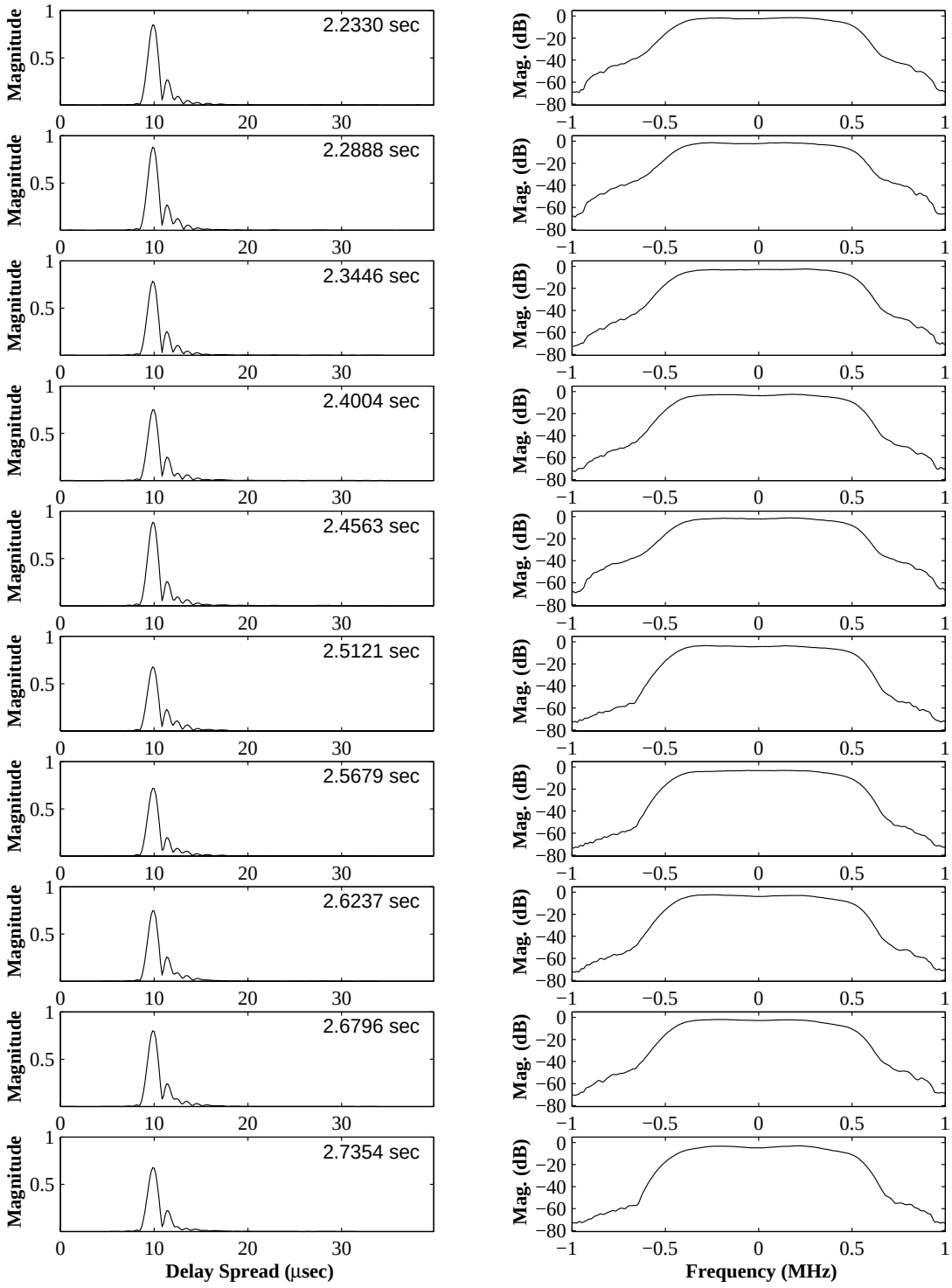

Figure 2.51: Local power delay profiles for hmmwv1328 (5).

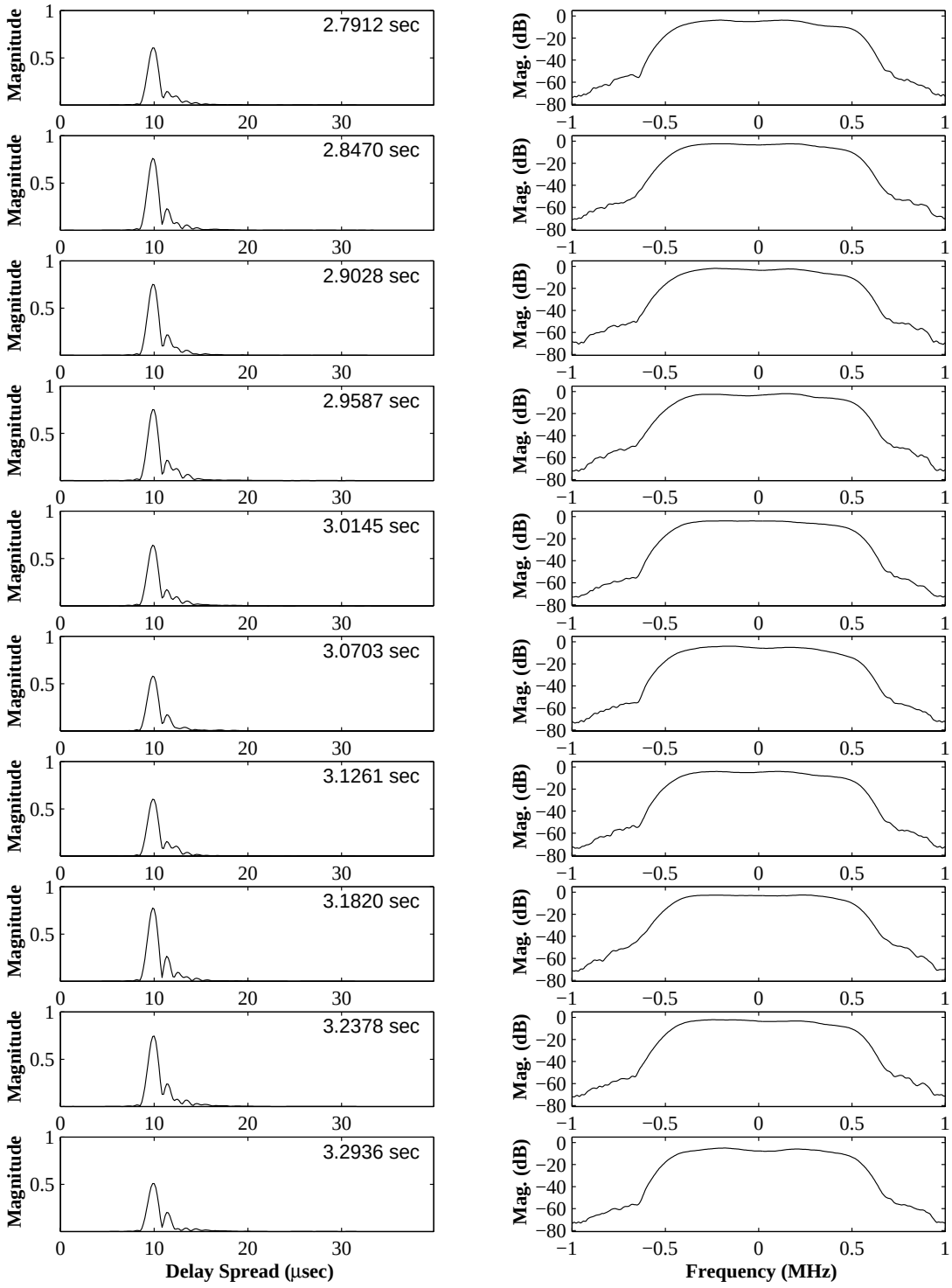

Figure 2.52: Local power delay profiles for hmmwv1328 (6).

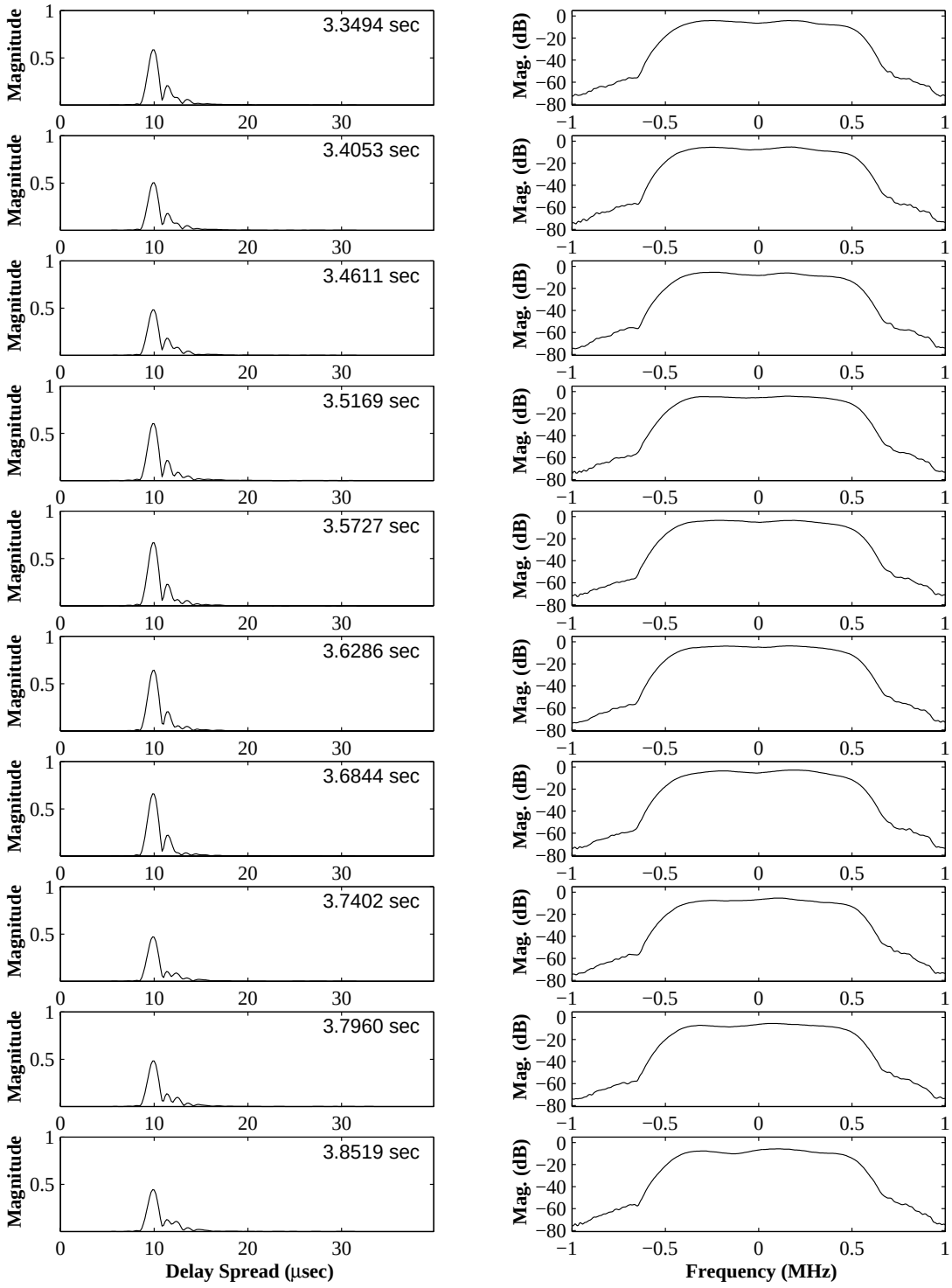

Figure 2.53: Local power delay profiles for hmmwv1328 (7).

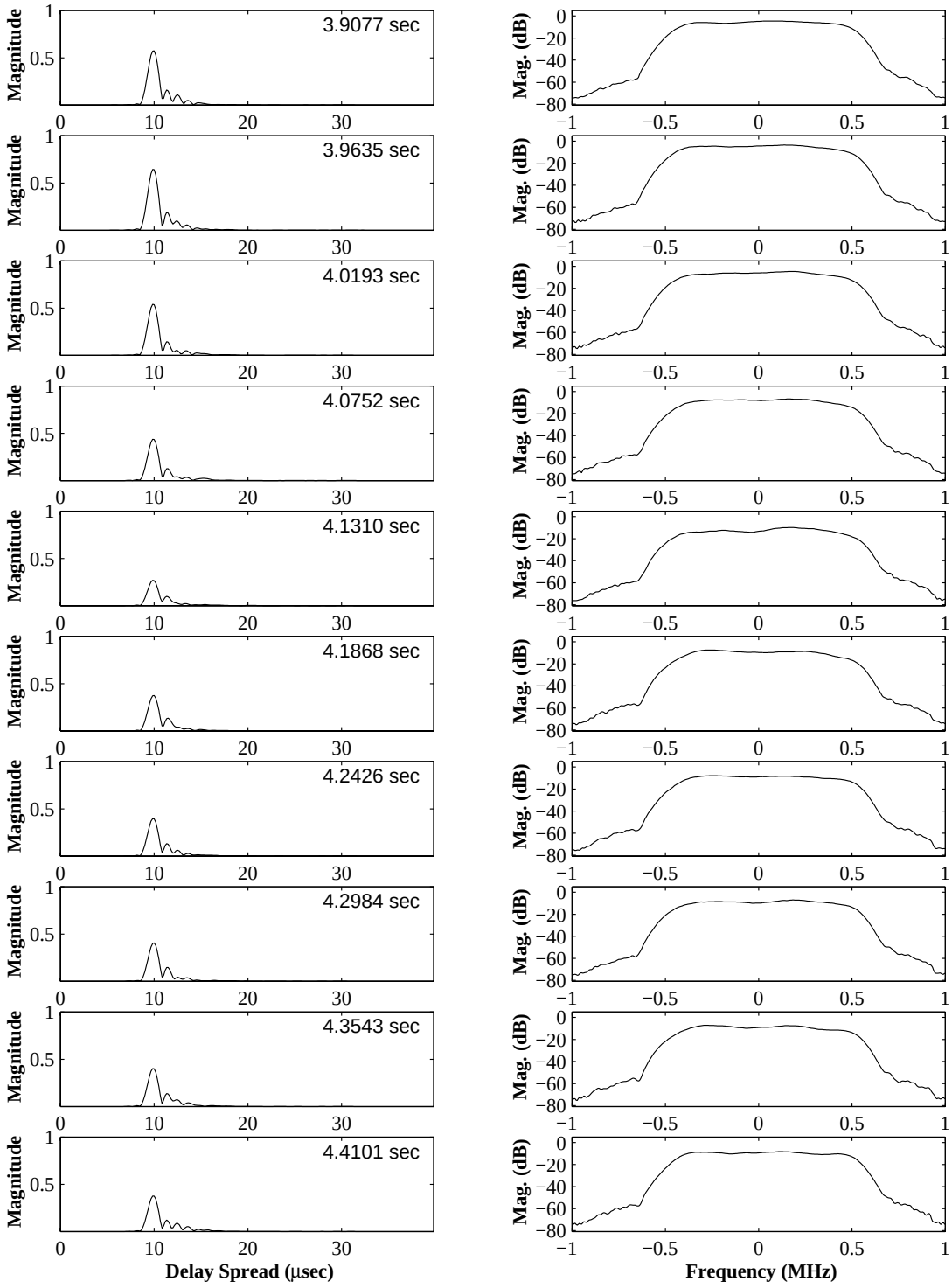

Figure 2.54: Local power delay profiles for hmmwv1328 (8).

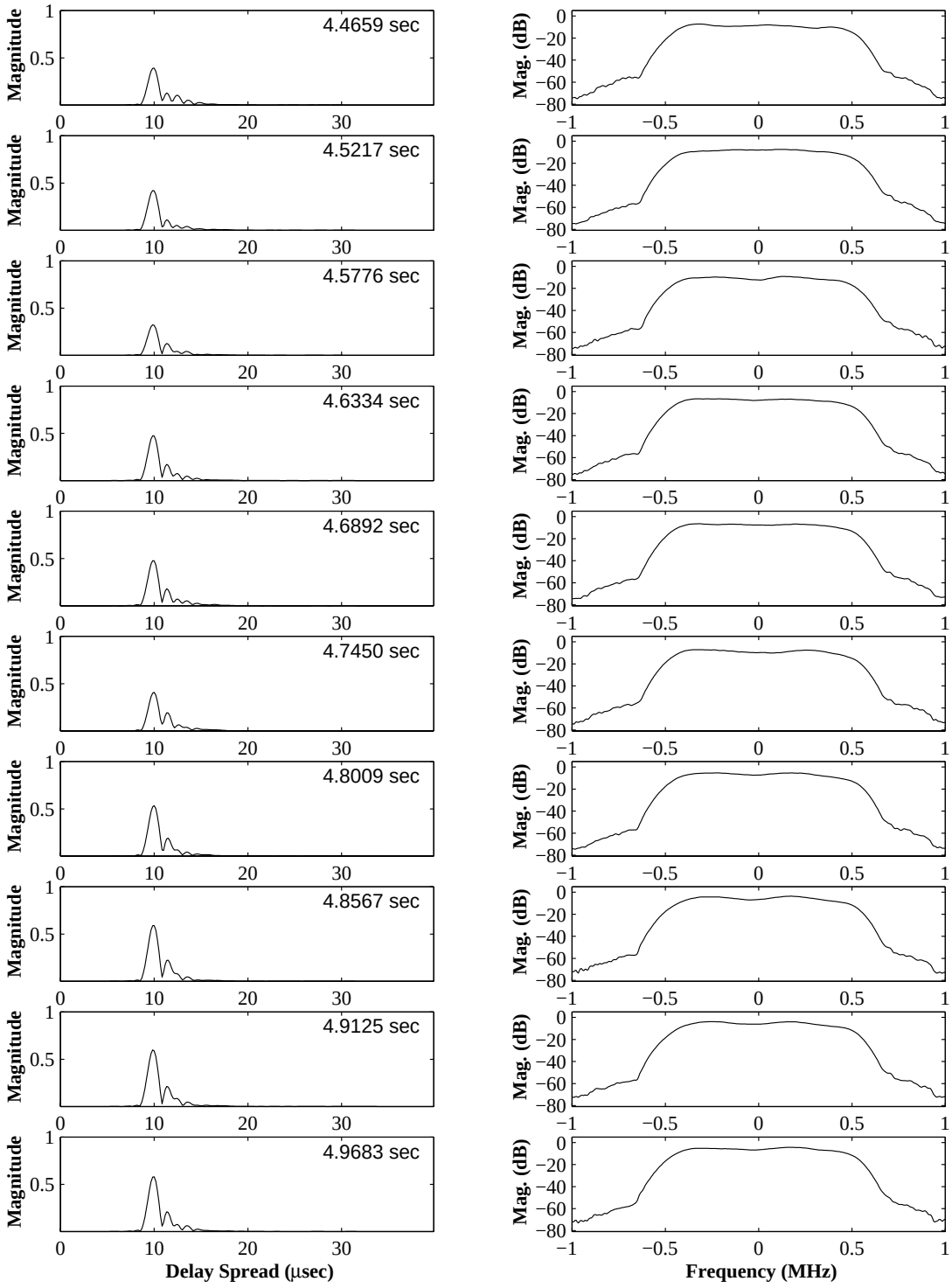

Figure 2.55: Local power delay profiles for hmmwv1328 (9).

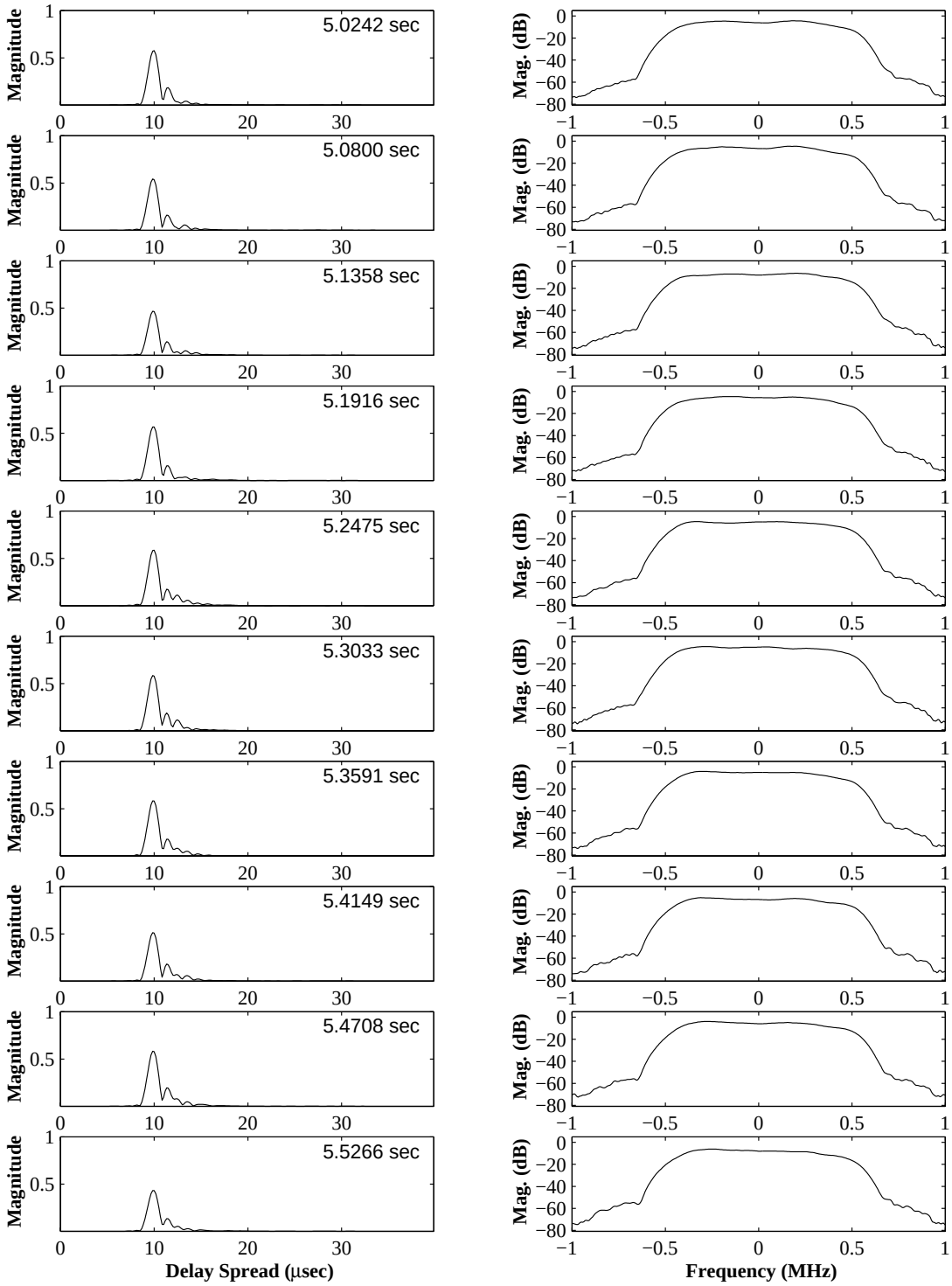

Figure 2.56: Local power delay profiles for hmmwv1328 (10).

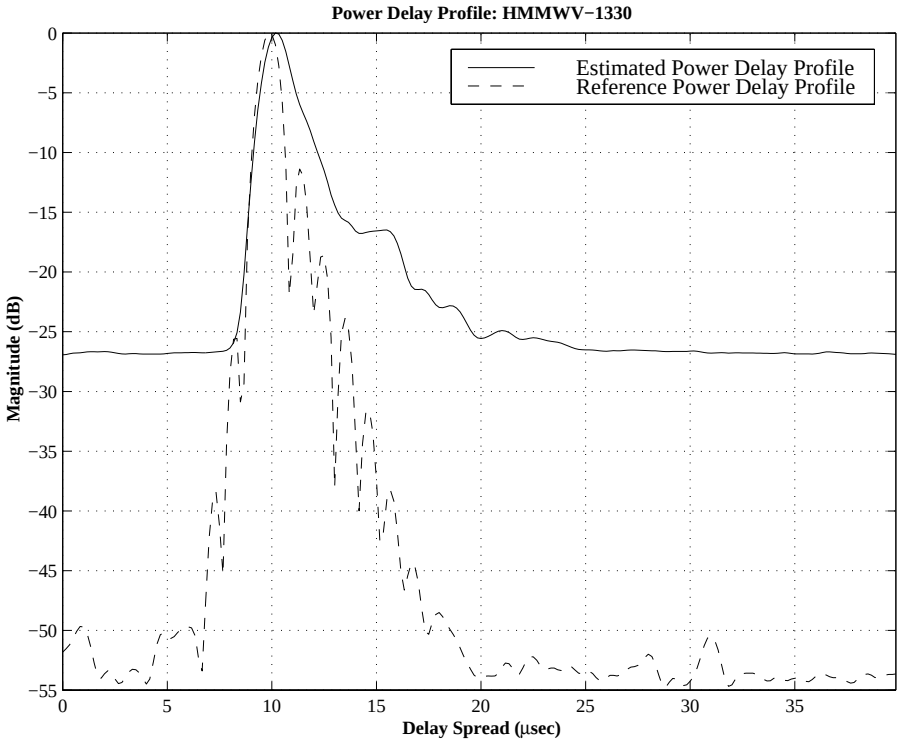

Figure 2.57: Power delay profile for hmmwv1330.

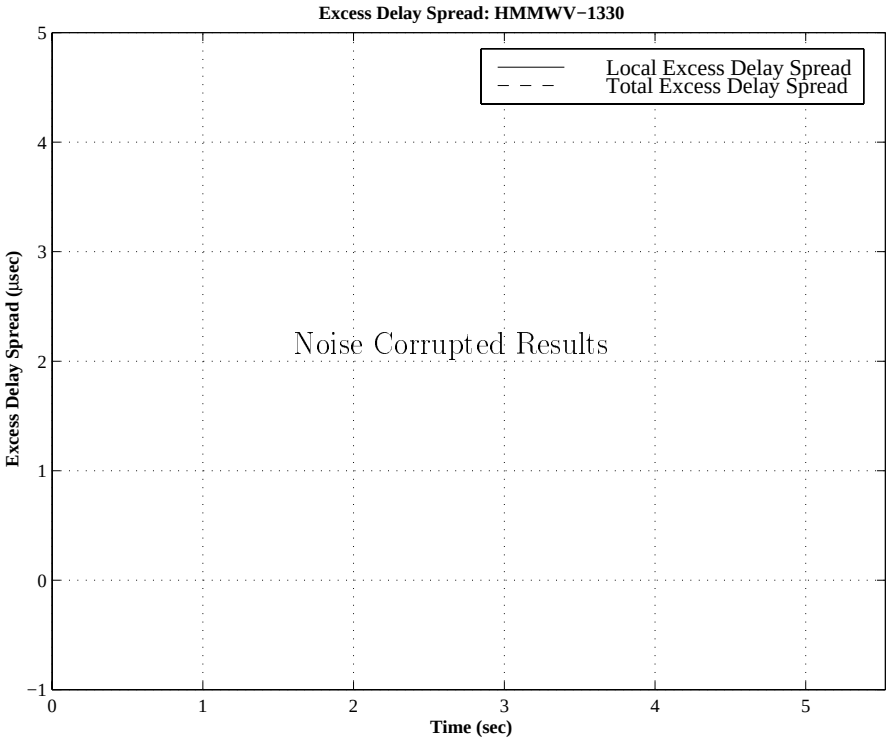

Figure 2.58: Excess delay spread for hmmwv1330.

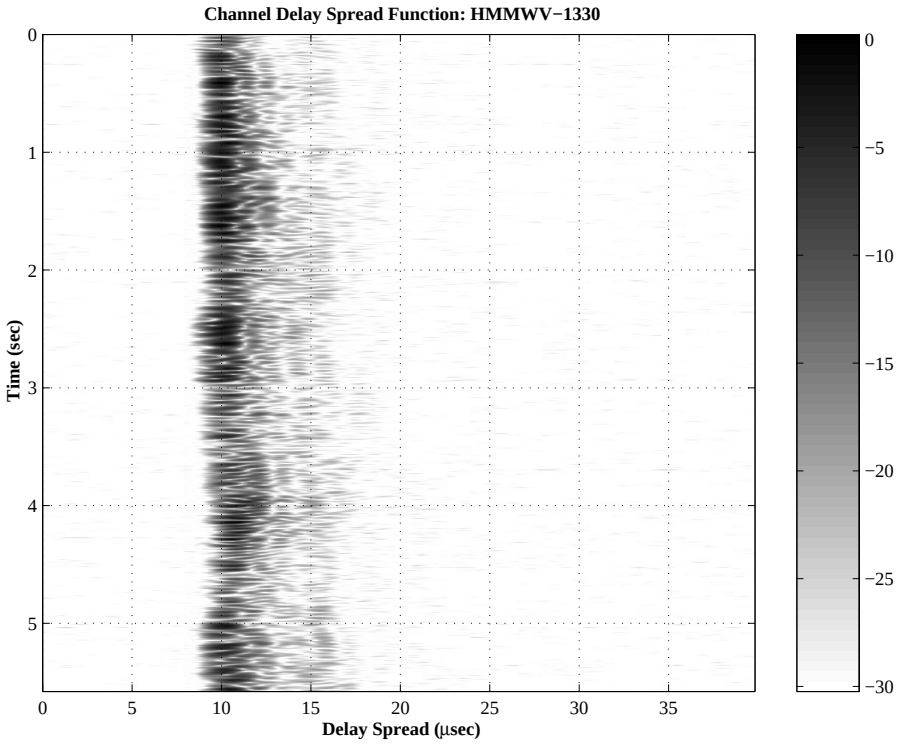

Figure 2.59: Channel delay spread function for hmmwv1330.

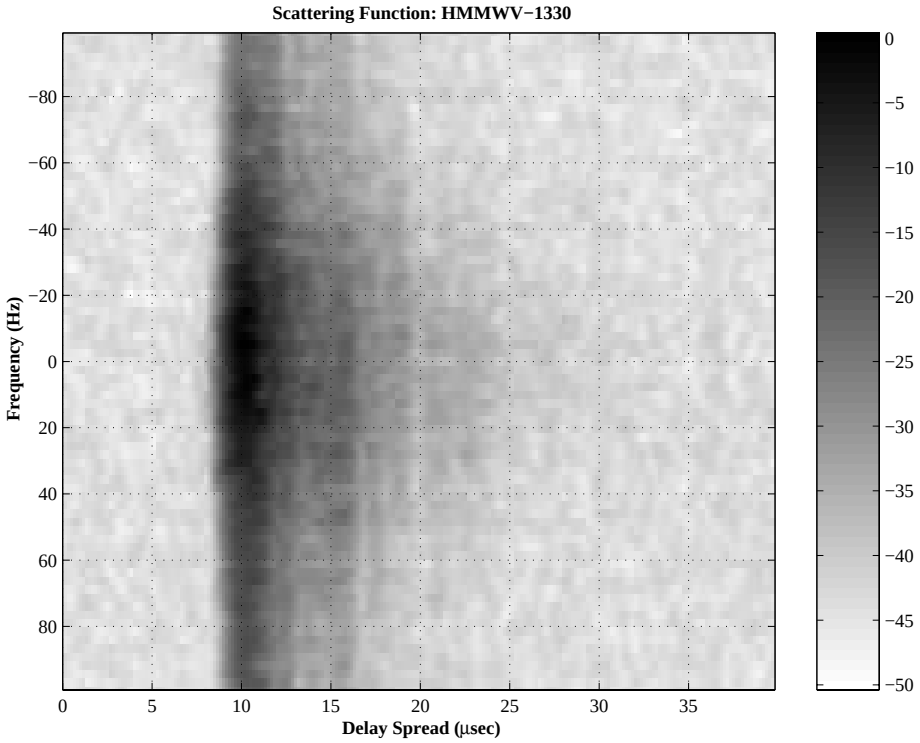

Figure 2.60: Scattering function for hmmwv1330.

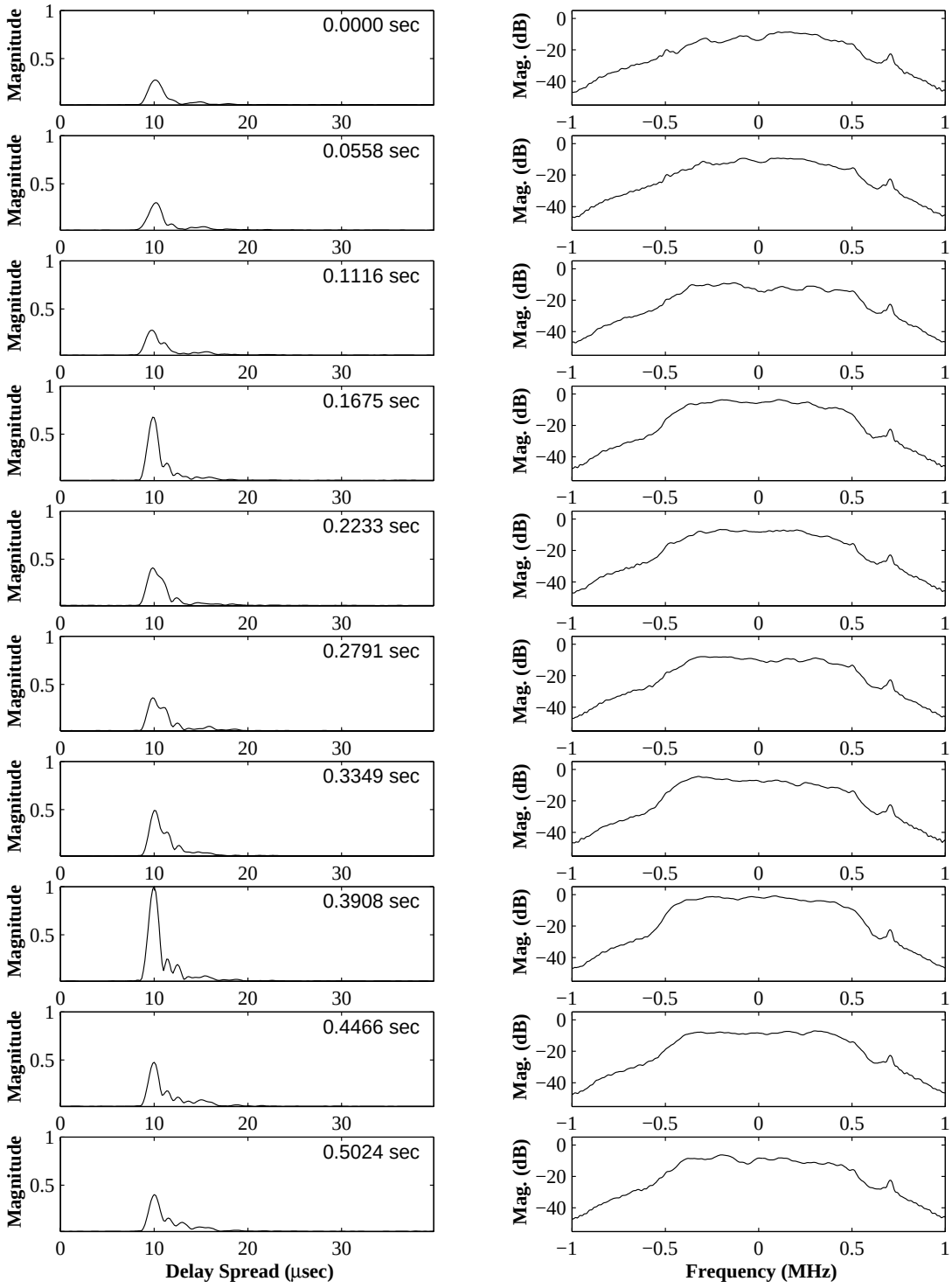

Figure 2.61: Local power delay profiles for hmmwv1330 (1).

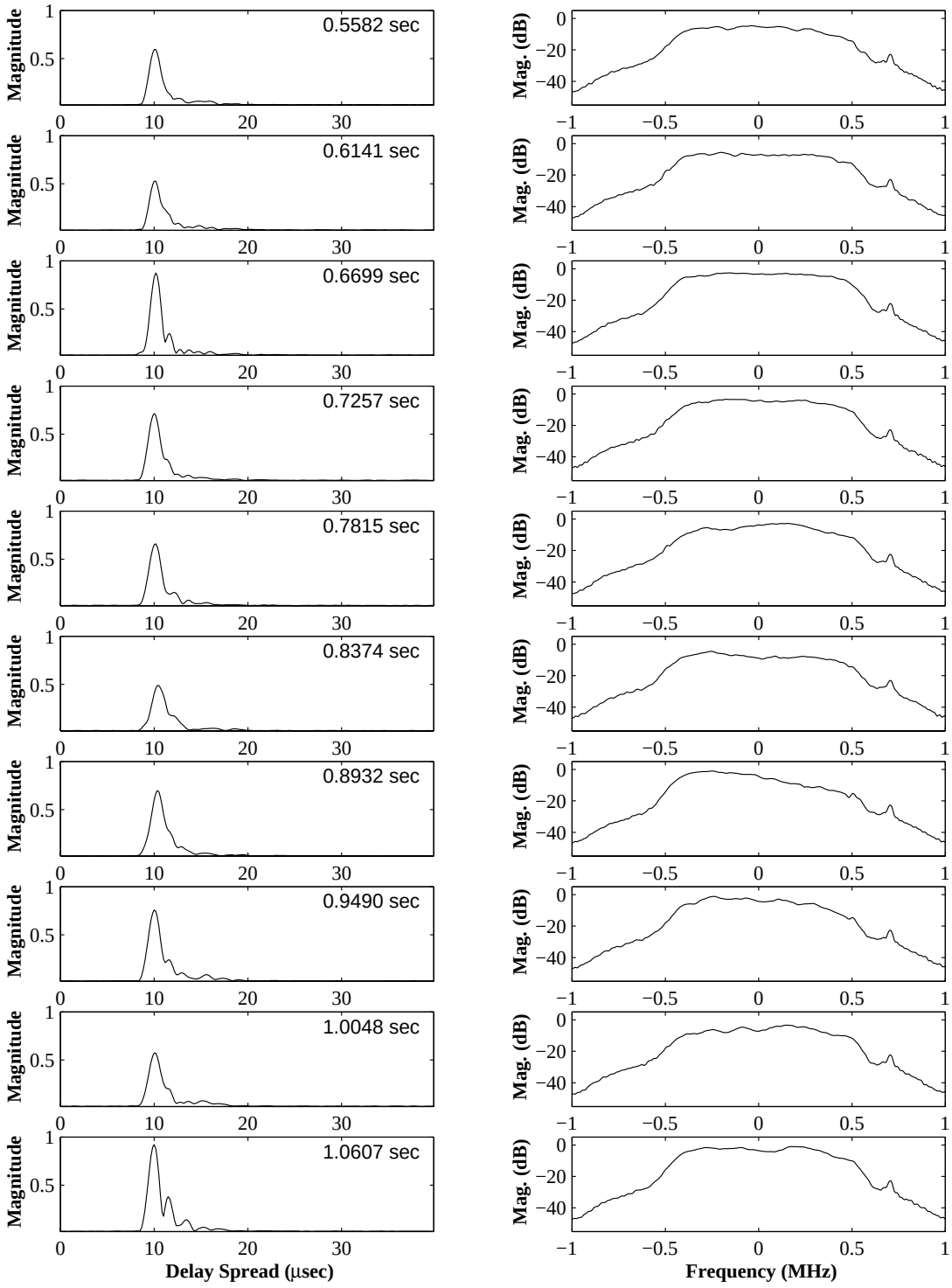

Figure 2.62: Local power delay profiles for hmmwv1330 (2).

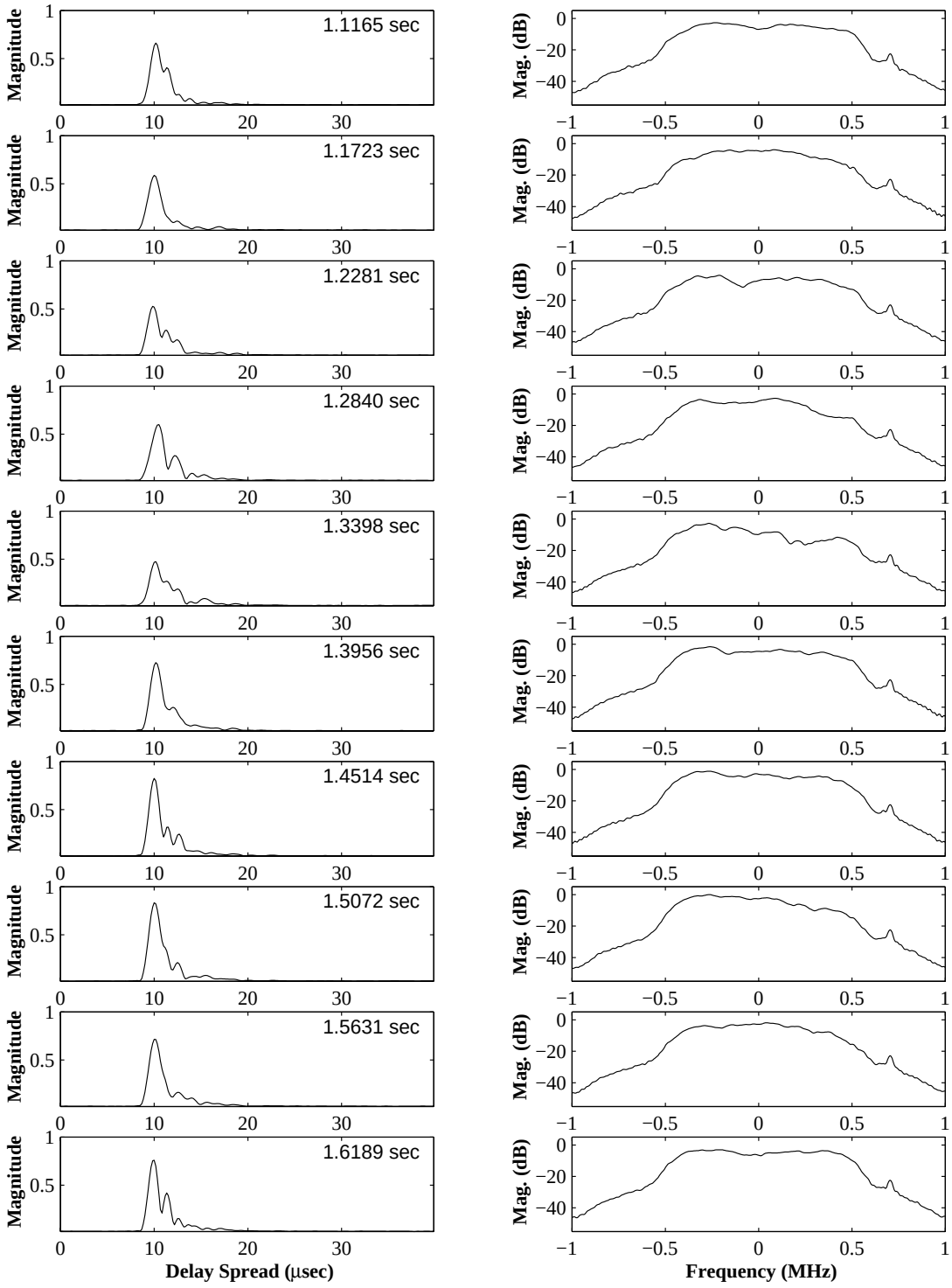

Figure 2.63: Local power delay profiles for hmmwv1330 (3).

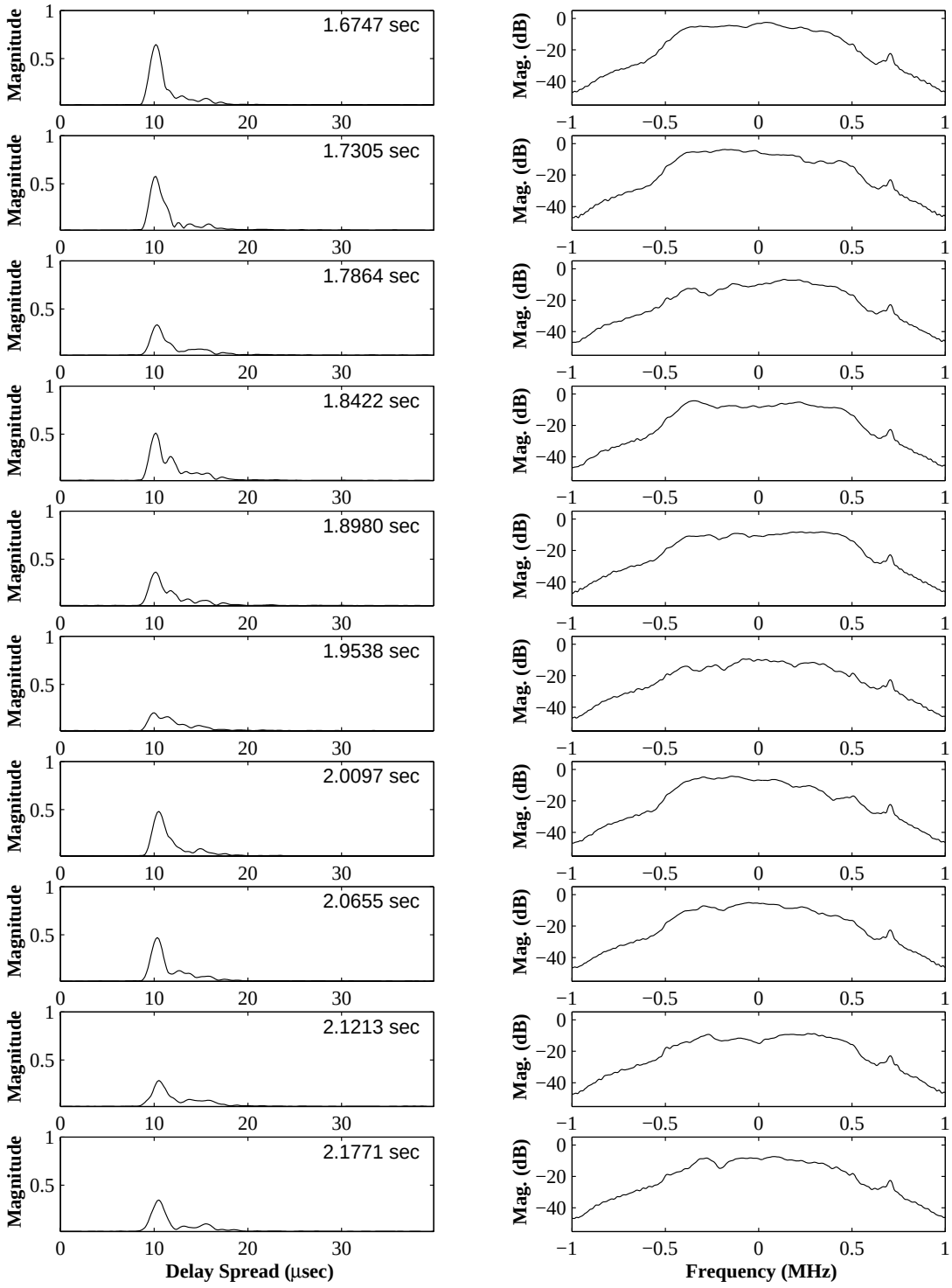

Figure 2.64: Local power delay profiles for hmmwv1330 (4).

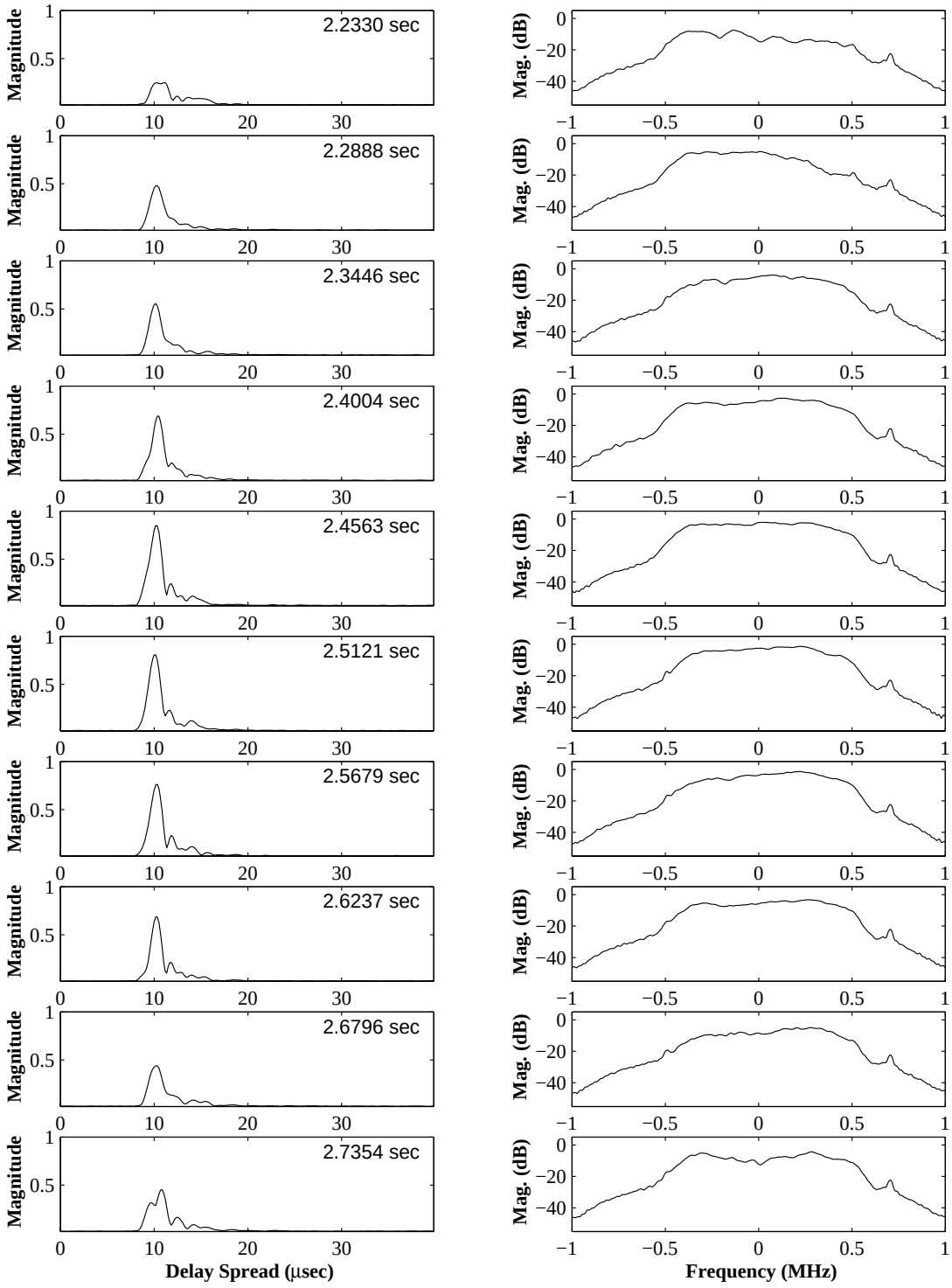

Figure 2.65: Local power delay profiles for hmmwv1330 (5).

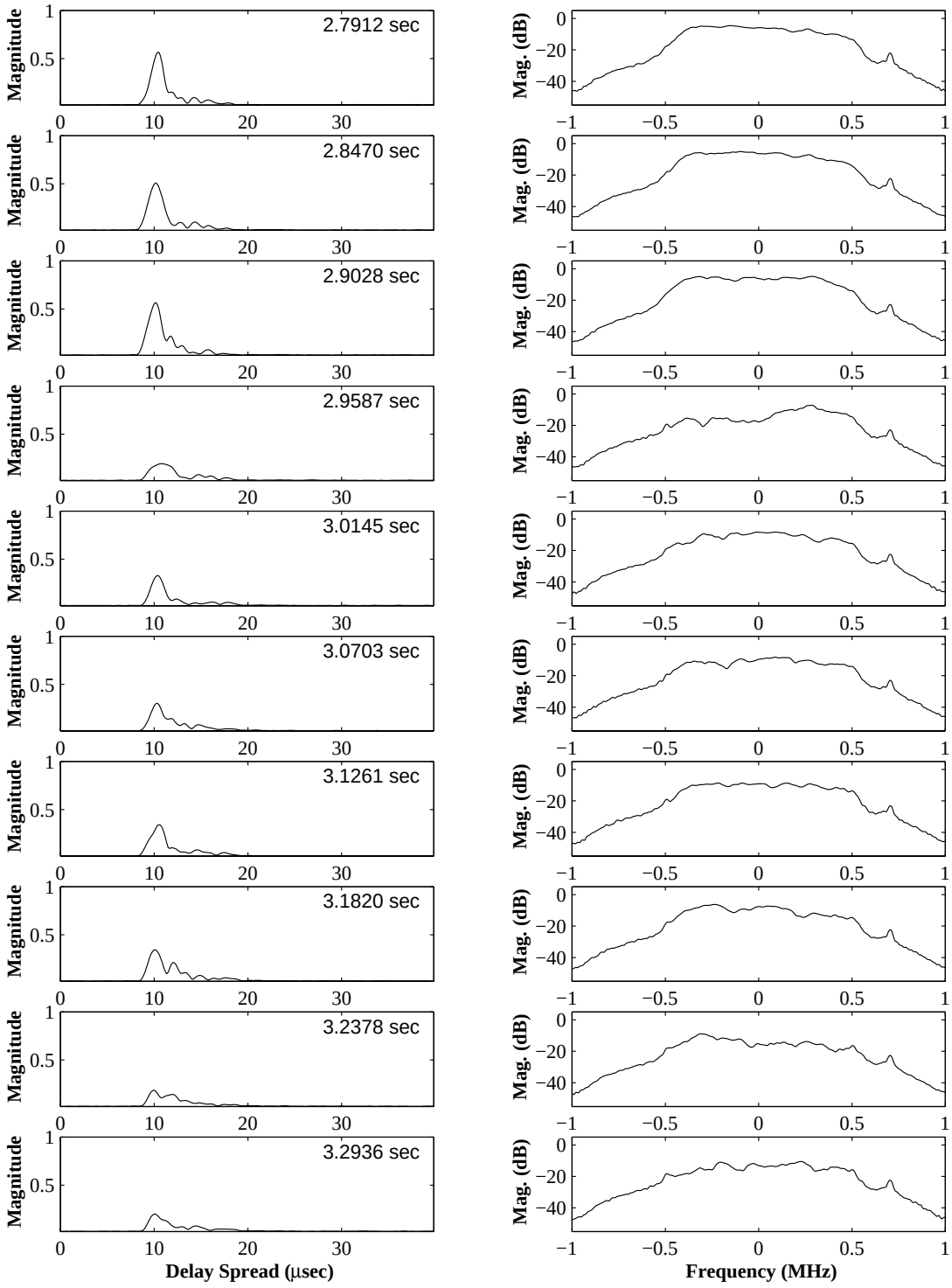

Figure 2.66: Local power delay profiles for hmmwv1330 (6).

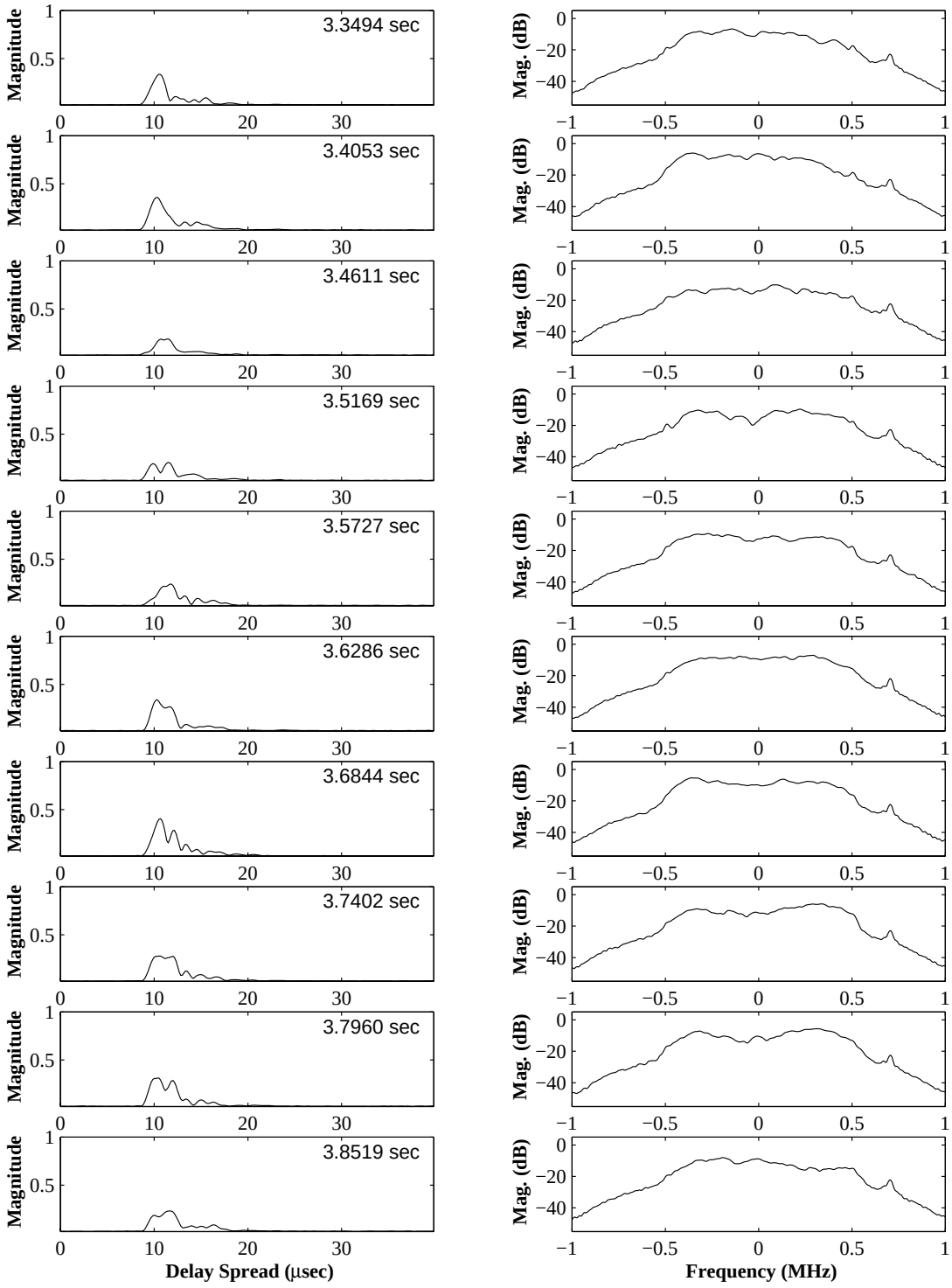

Figure 2.67: Local power delay profiles for hmmwv1330 (7).

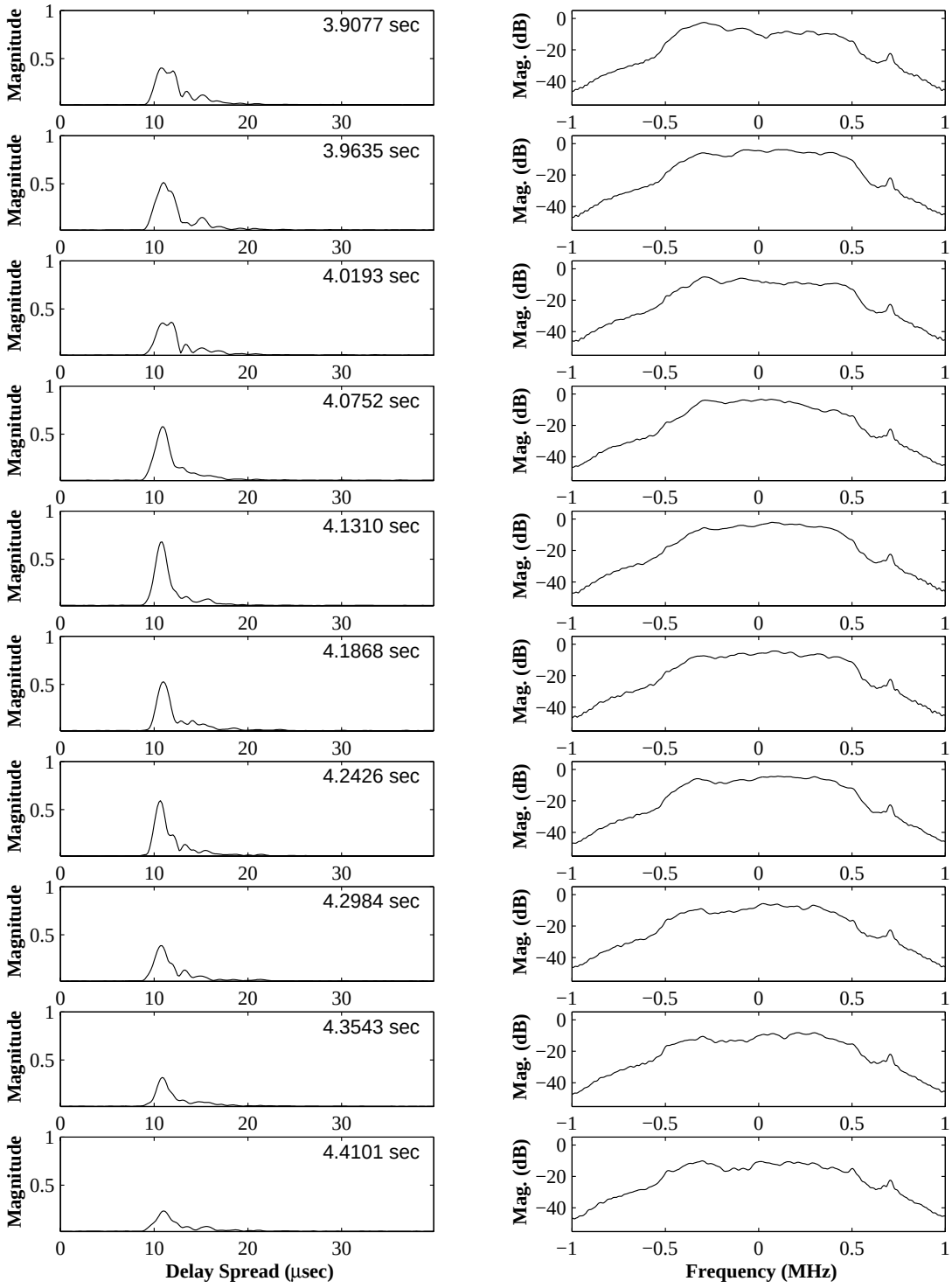

Figure 2.68: Local power delay profiles for hmmwv1330 (8).

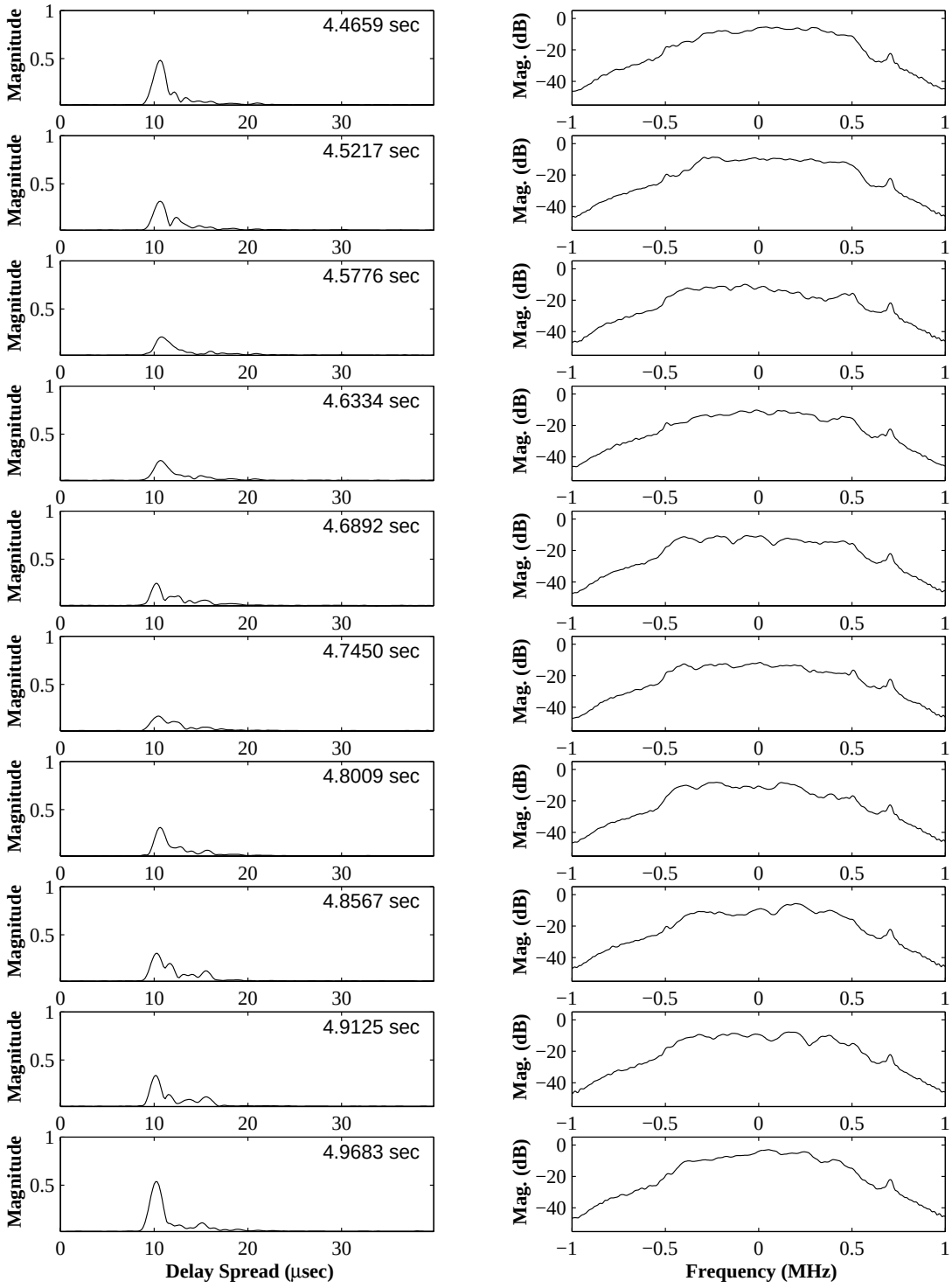

Figure 2.69: Local power delay profiles for hmmwv1330 (9).

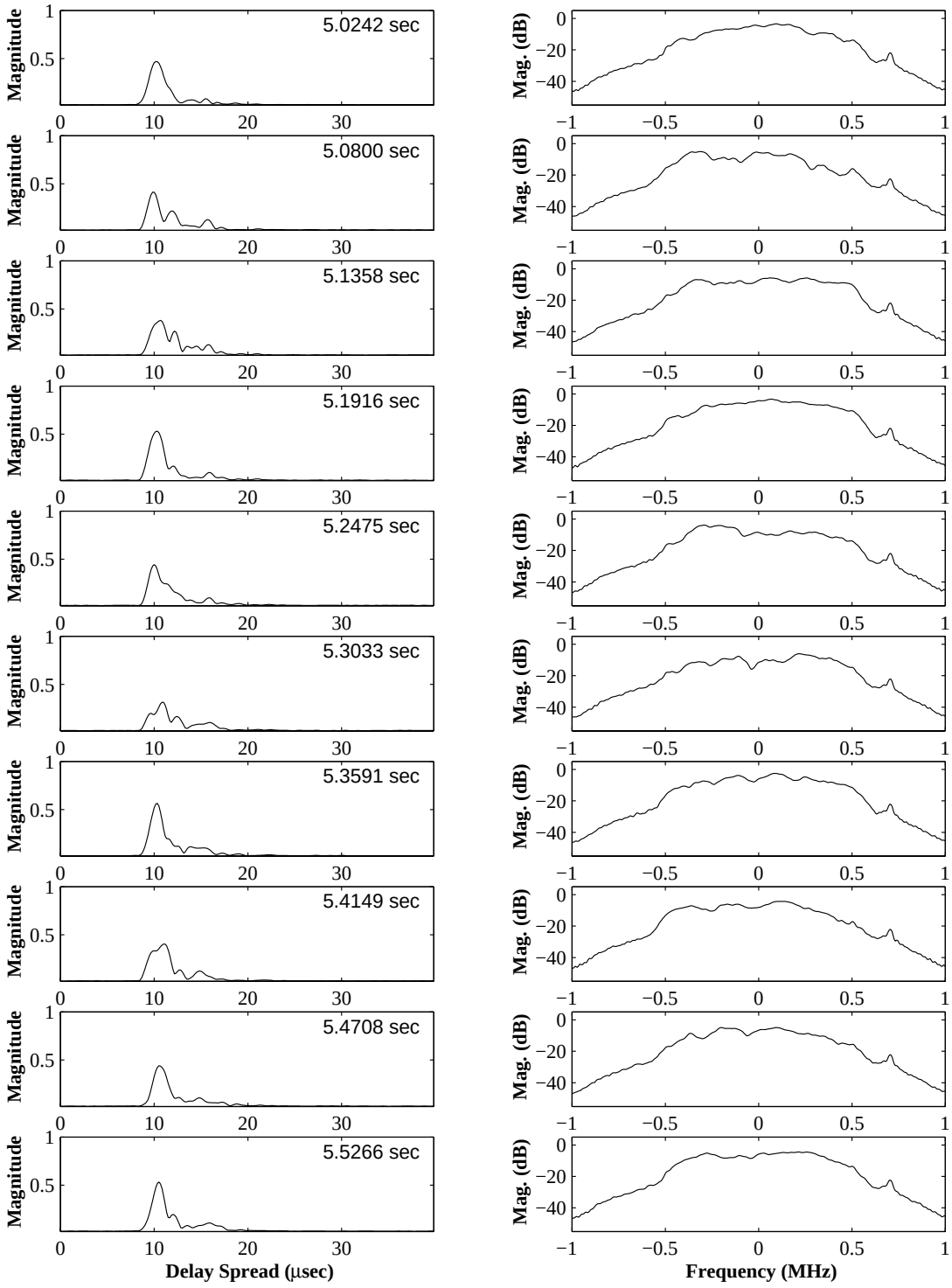

Figure 2.70: Local power delay profiles for hmmwv1330 (10).

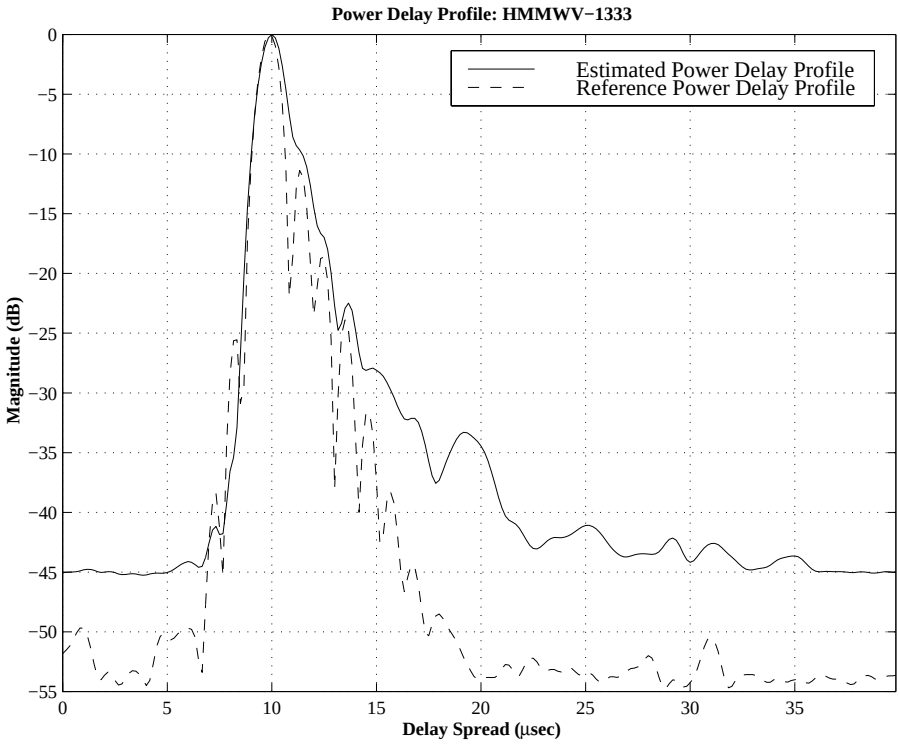

Figure 2.71: Power delay profile for hmmwv1333.

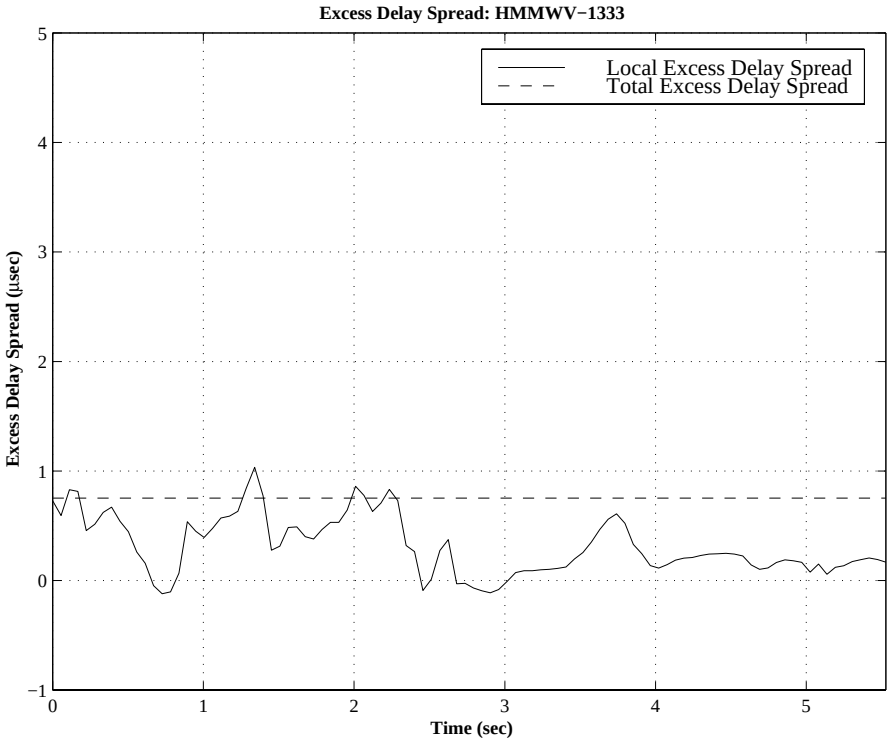

Figure 2.72: Excess delay spread for hmmwv1333.

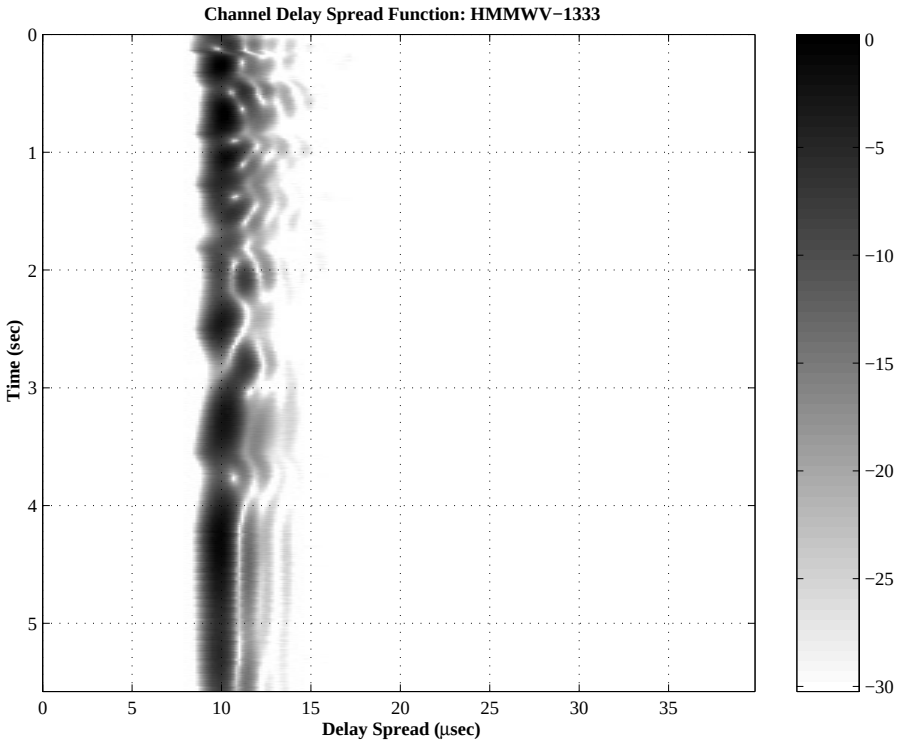

Figure 2.73: Channel delay spread function for hmmwv1333.

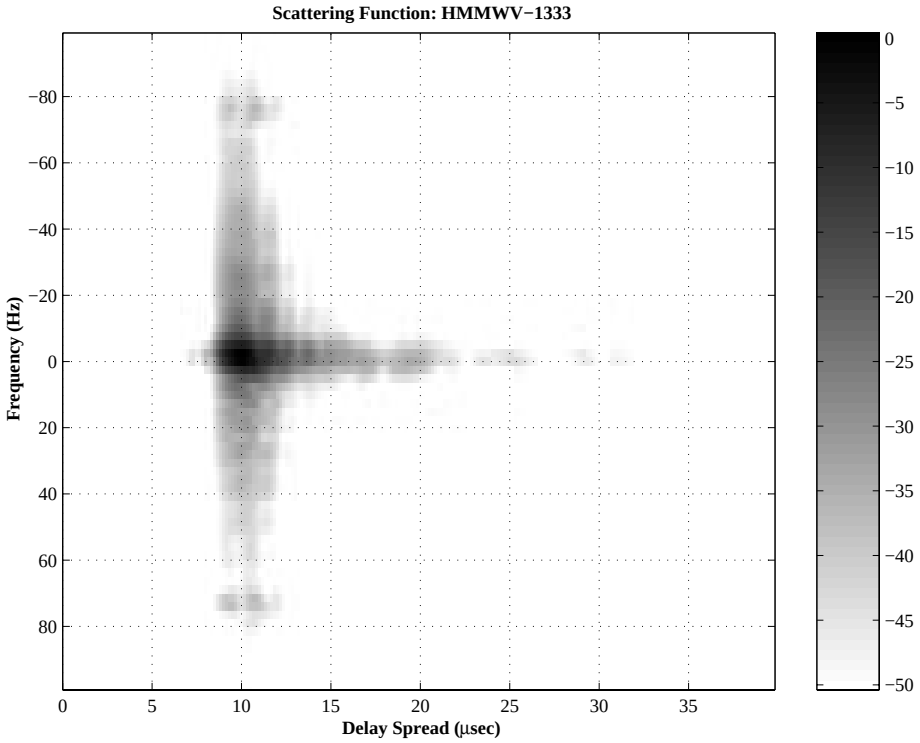

Figure 2.74: Scattering function for hmmwv1333.

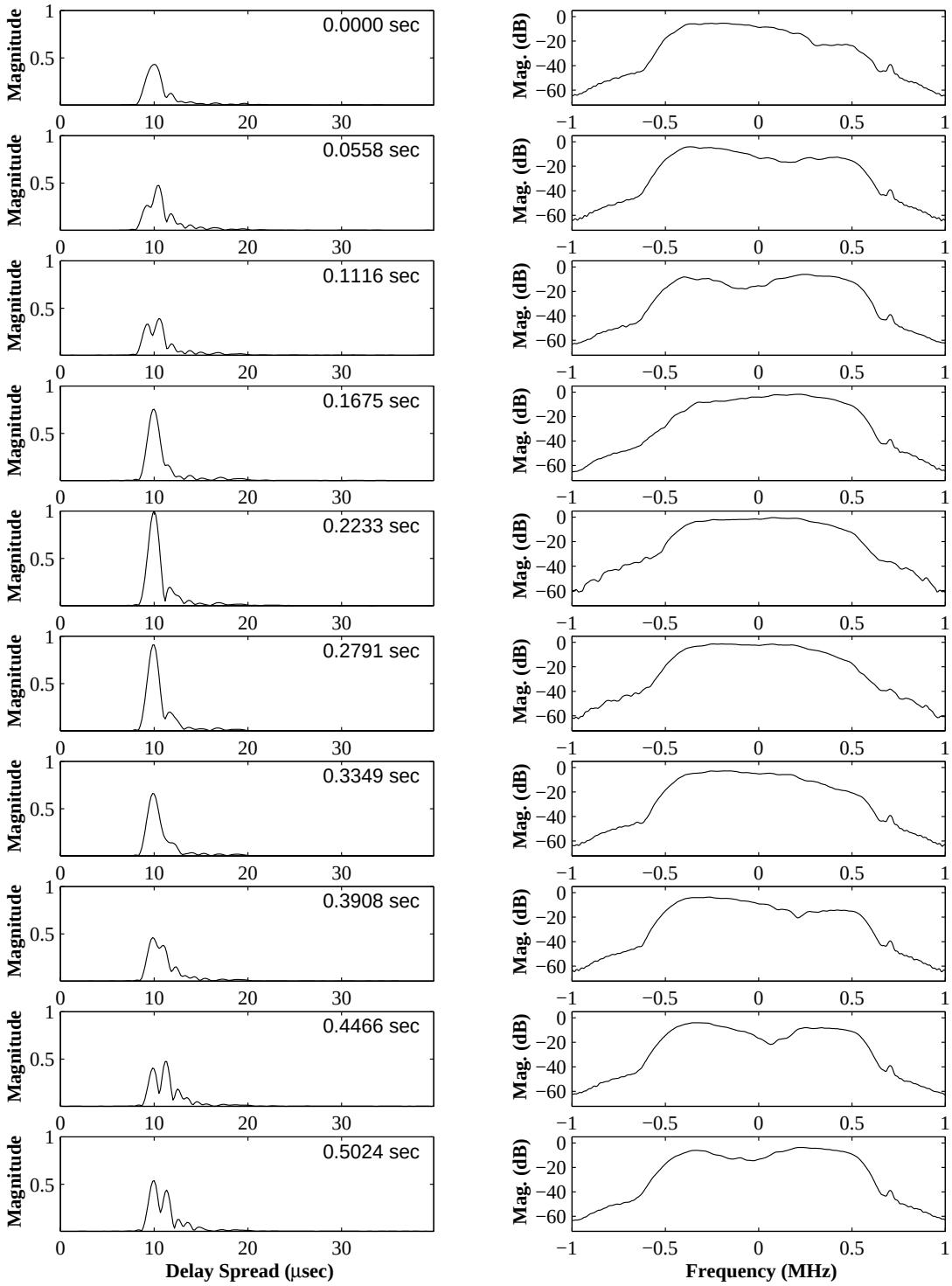

Figure 2.75: Local power delay profiles for hmmwv1333 (1).

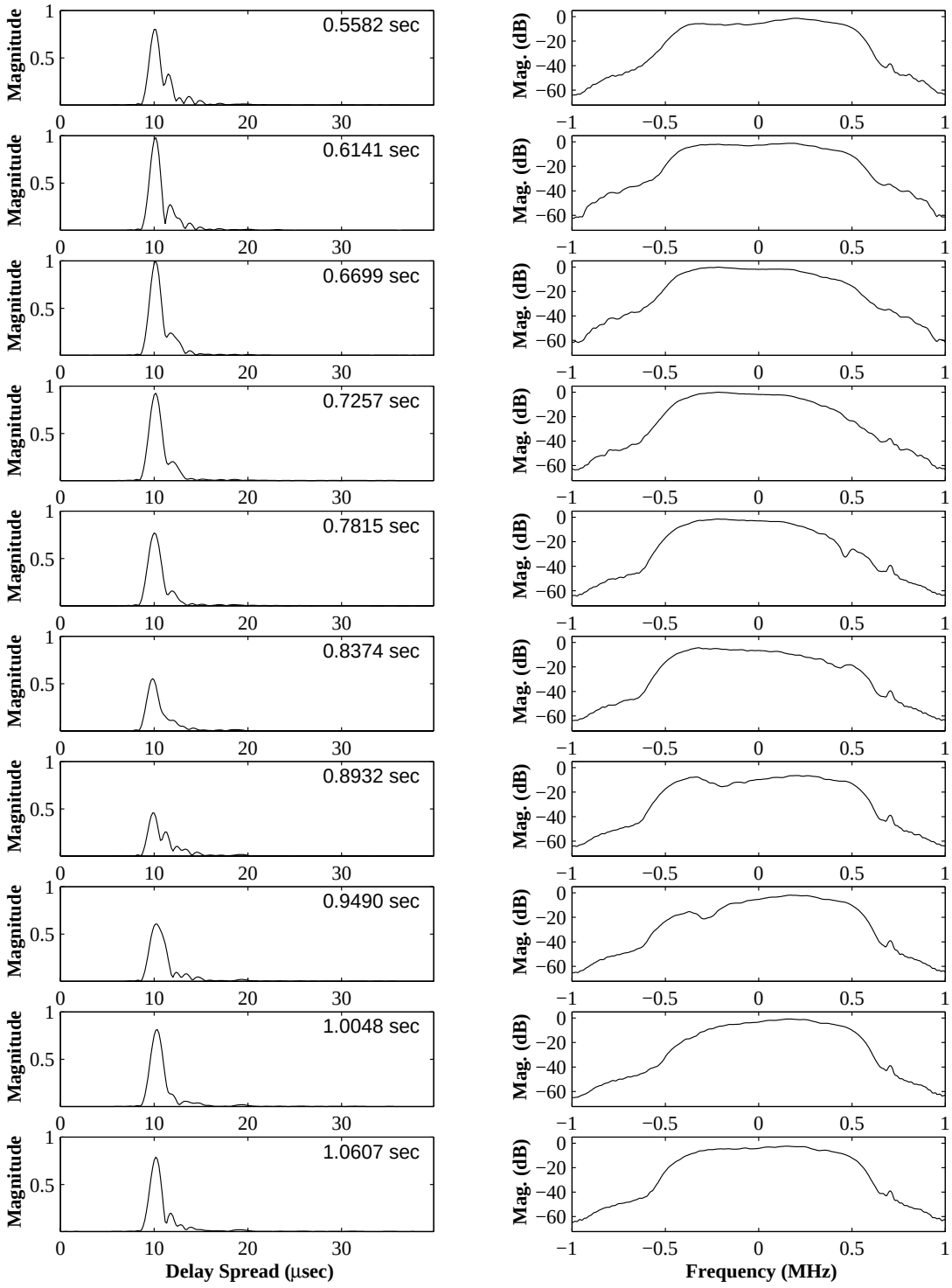

Figure 2.76: Local power delay profiles for hmmwv1333 (2).

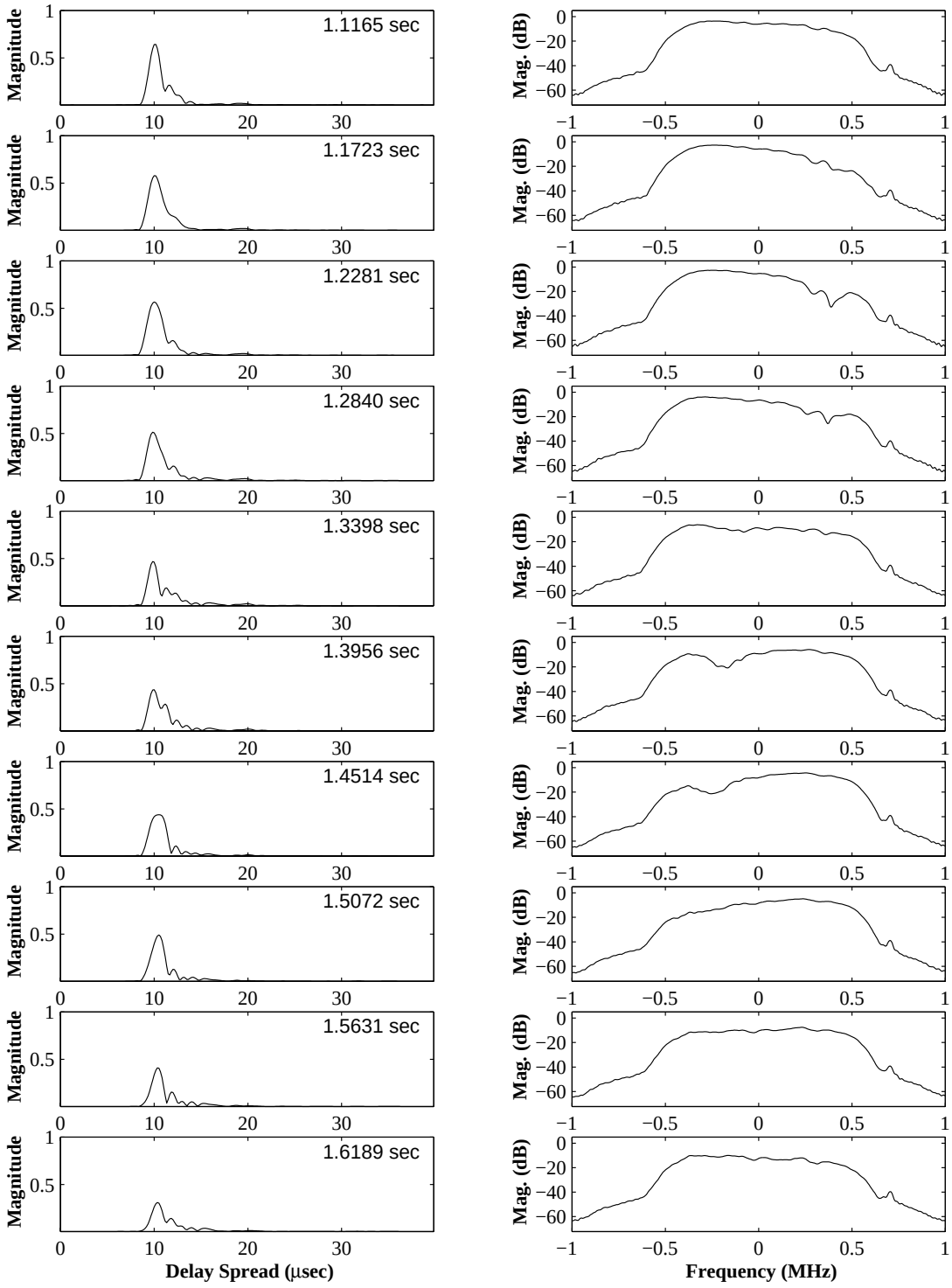

Figure 2.77: Local power delay profiles for hmmwv1333 (3).

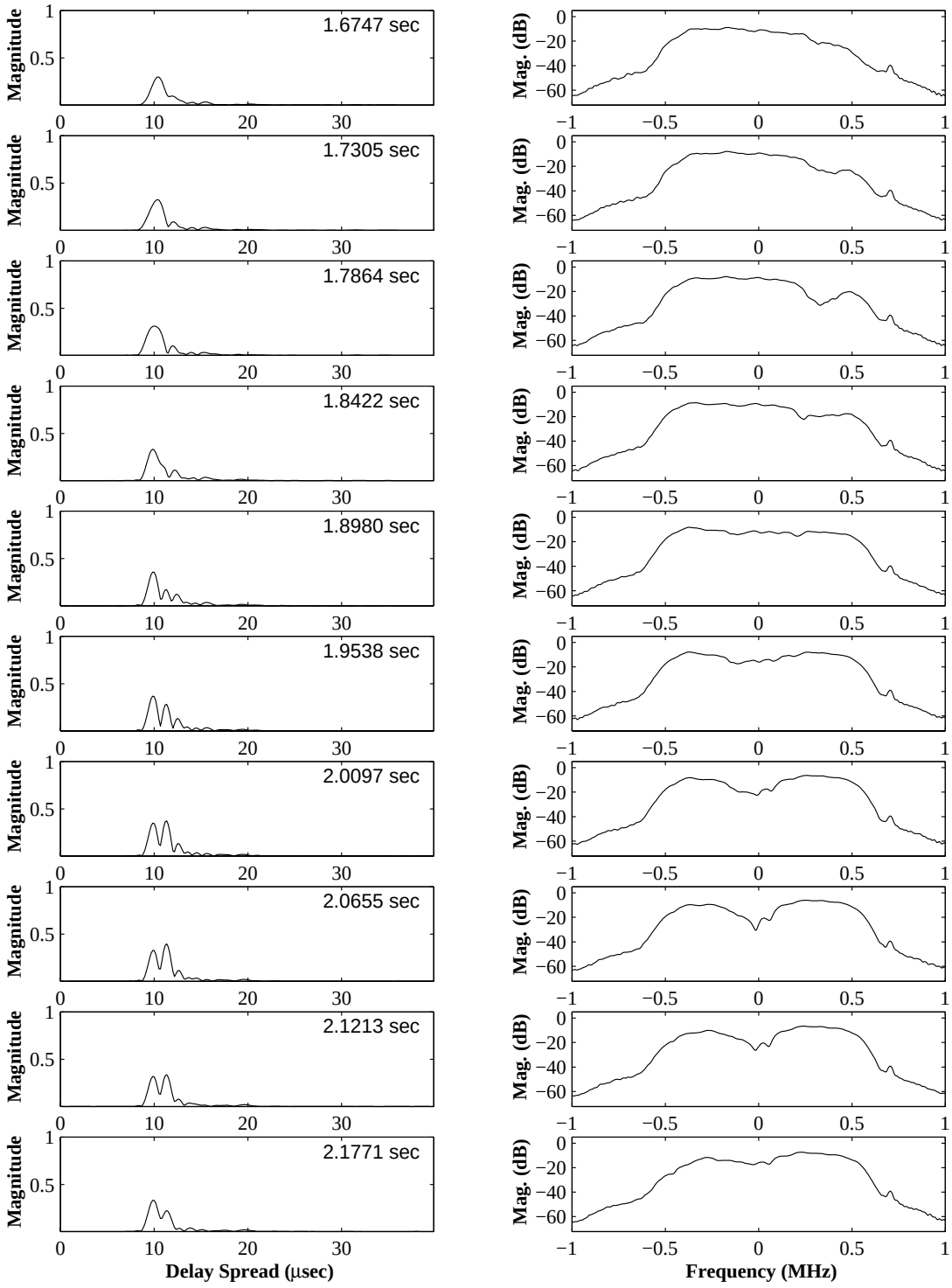

Figure 2.78: Local power delay profiles for hmmwv1333 (4).

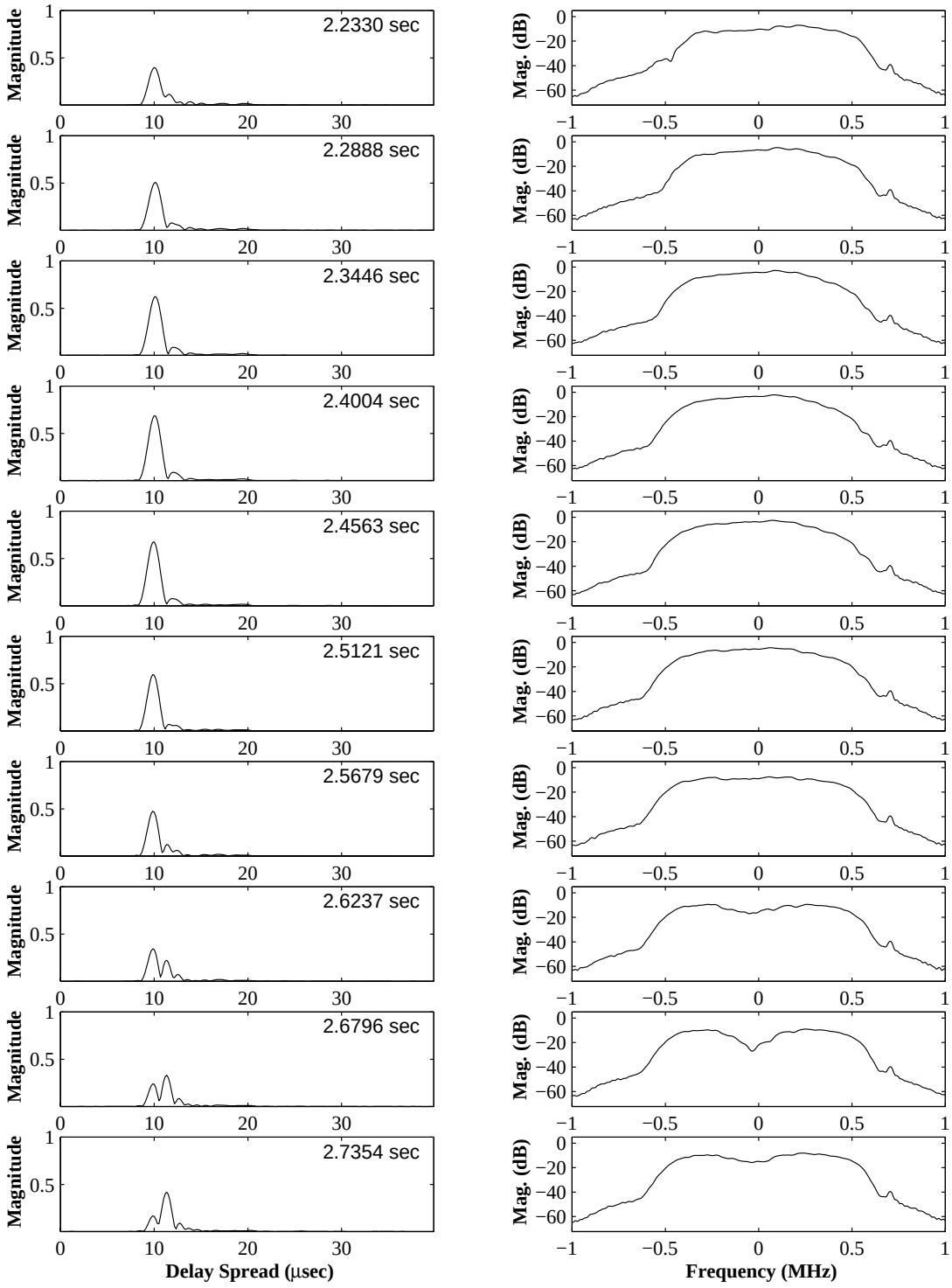

Figure 2.79: Local power delay profiles for hmmwv1333 (5).

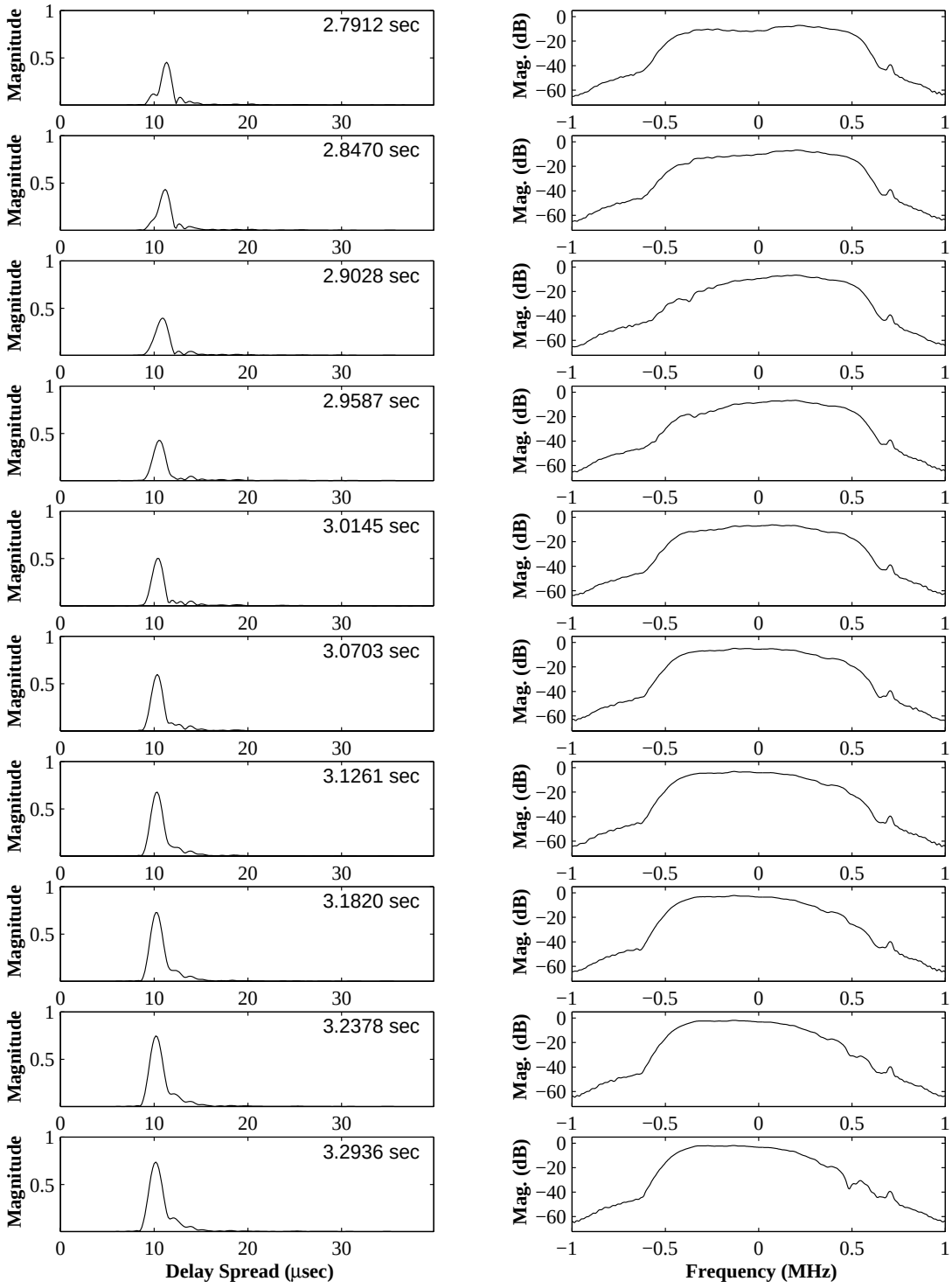

Figure 2.80: Local power delay profiles for hmmwv1333 (6).

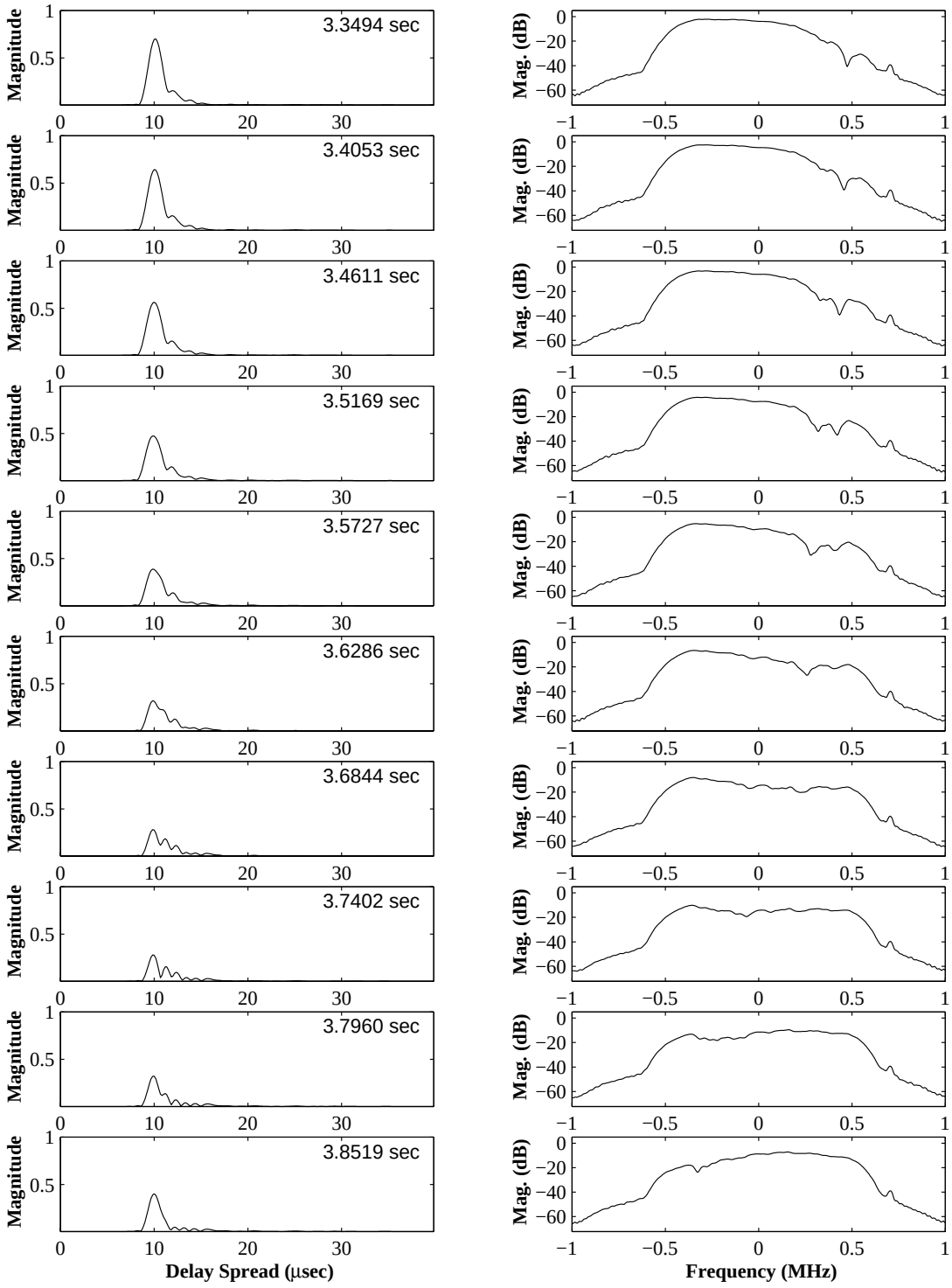

Figure 2.81: Local power delay profiles for hmmwv1333 (7).

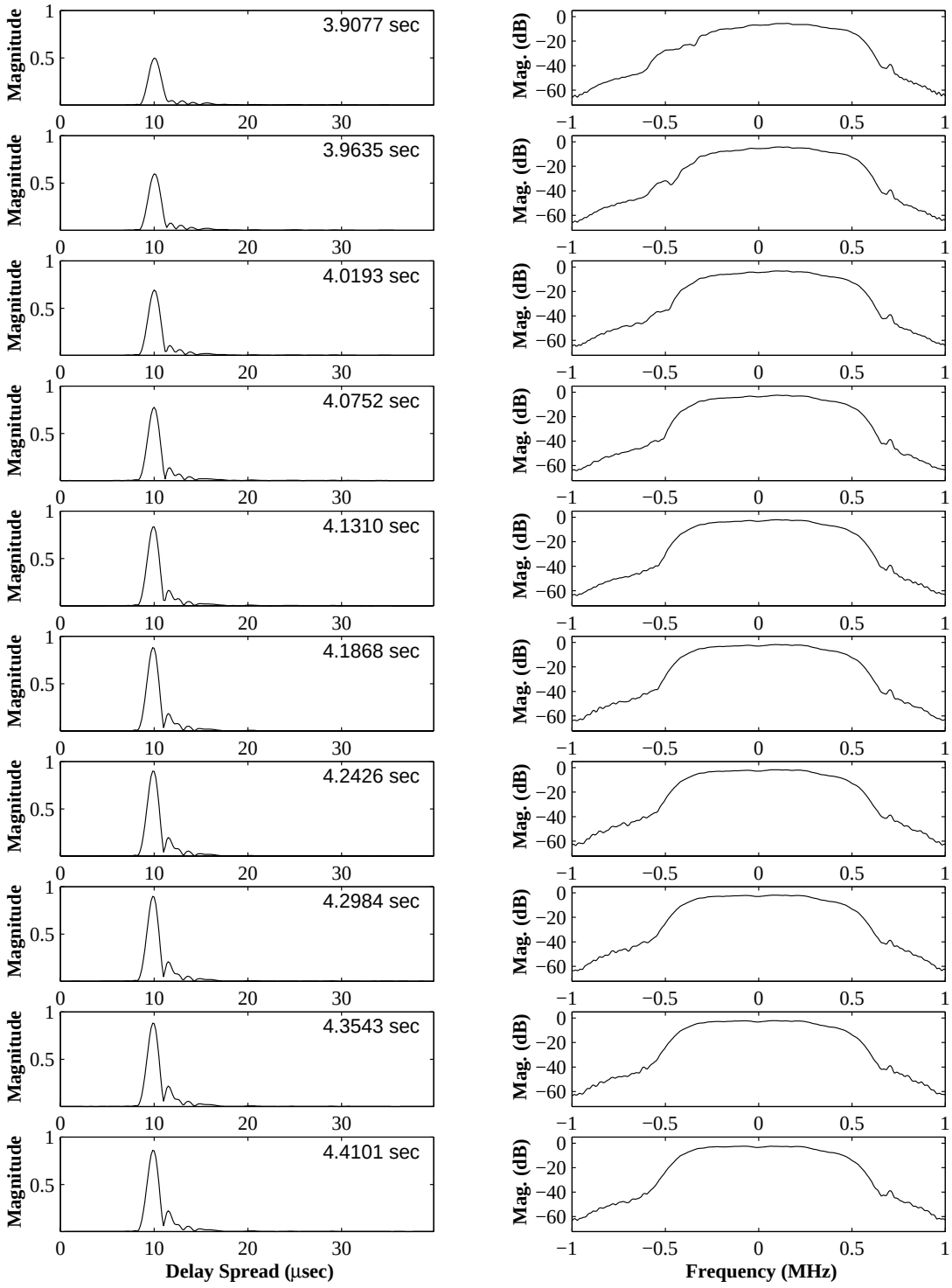

Figure 2.82: Local power delay profiles for hmmwv1333 (8).

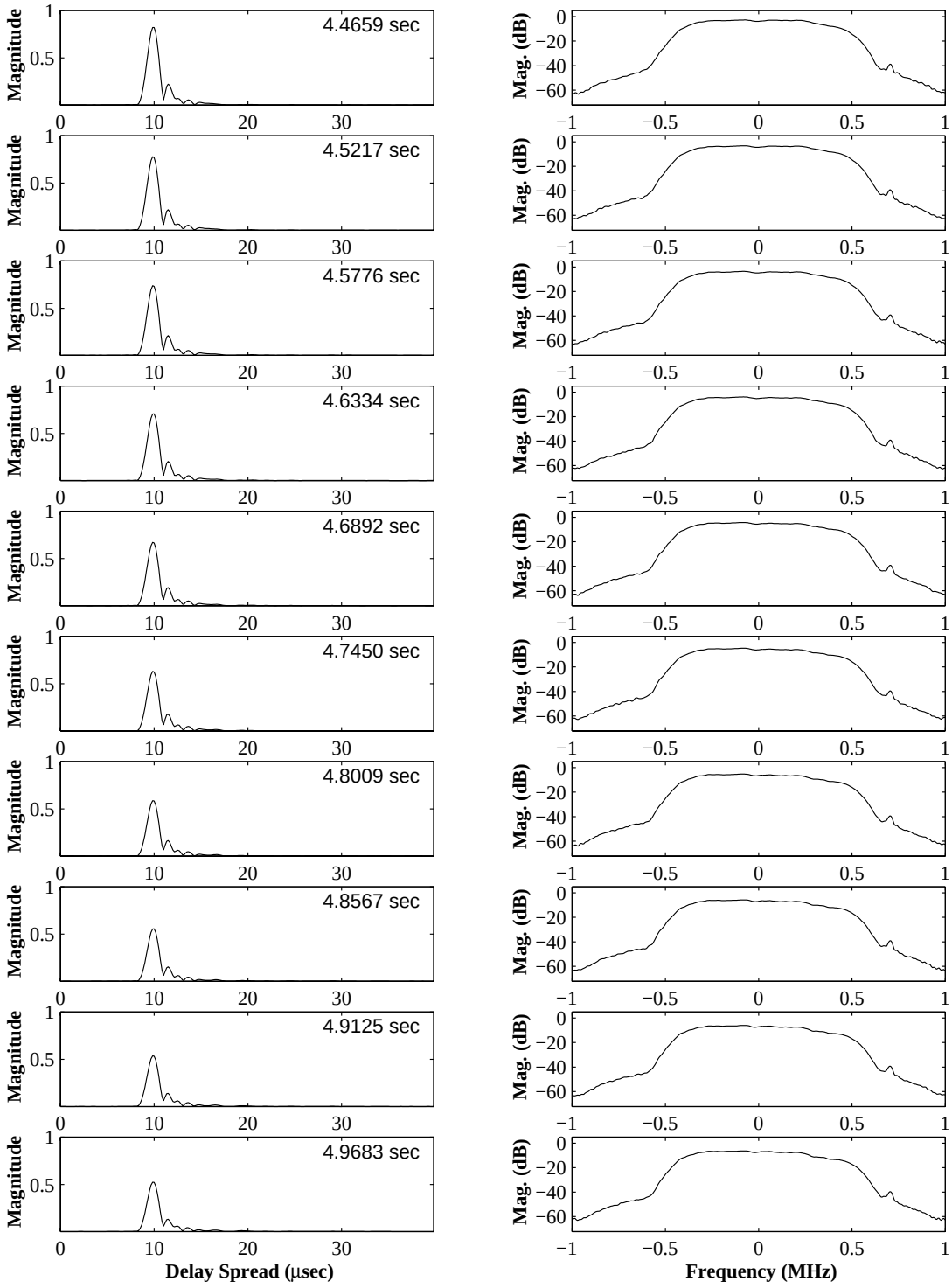

Figure 2.83: Local power delay profiles for hmmwv1333 (9).

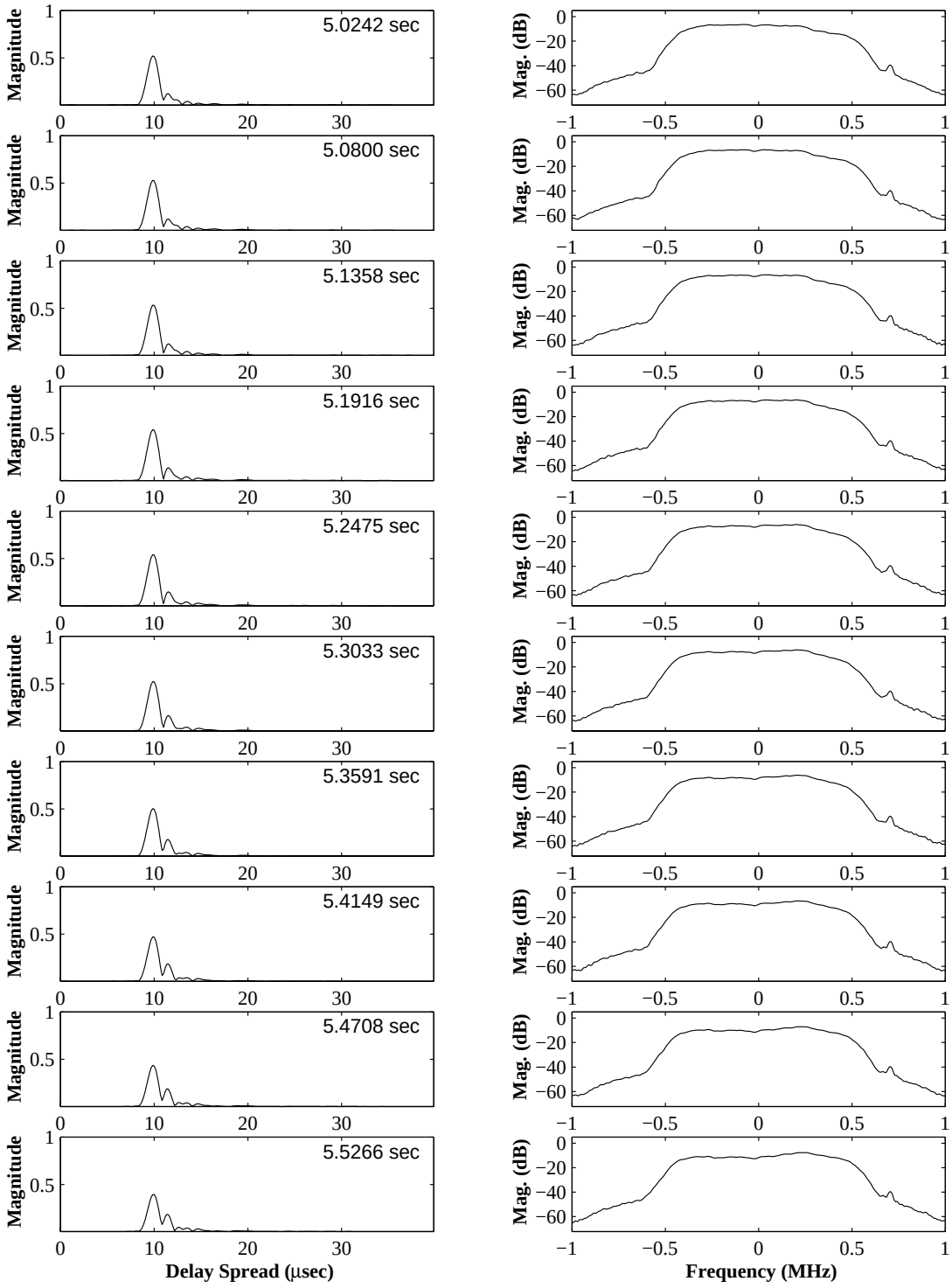

Figure 2.84: Local power delay profiles for hmmwv1333 (10).

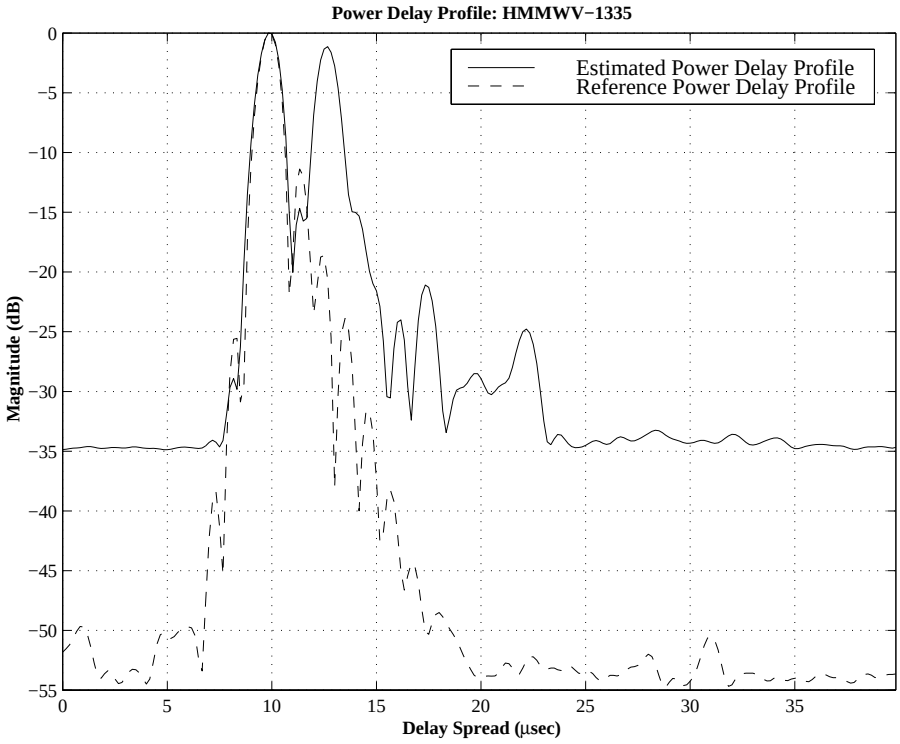

Figure 2.85: Power delay profile for hmmwv1335.

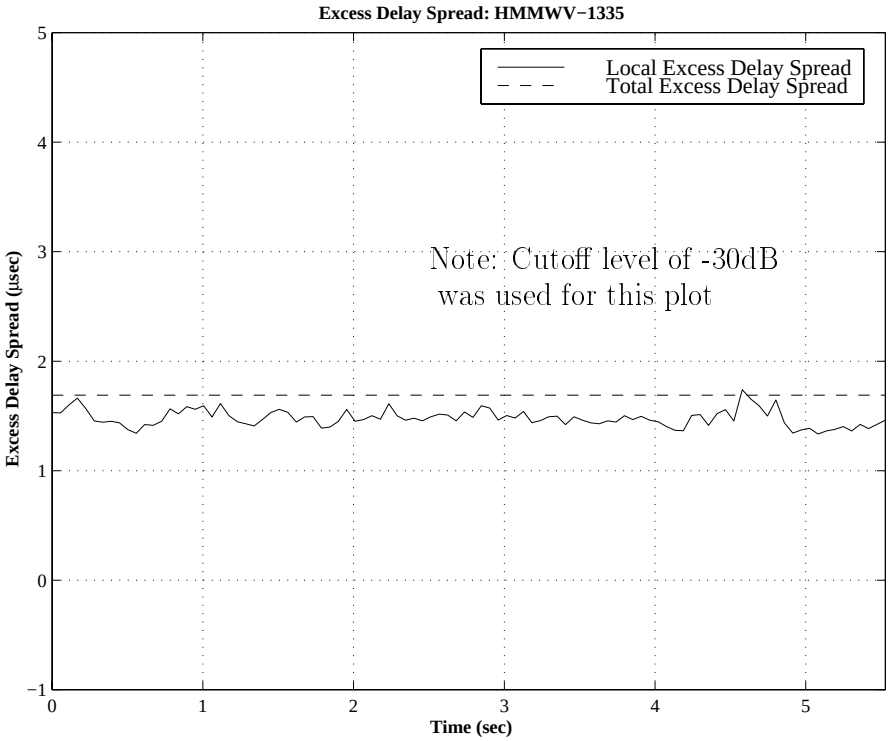

Figure 2.86: Excess delay spread for hmmwv1335.

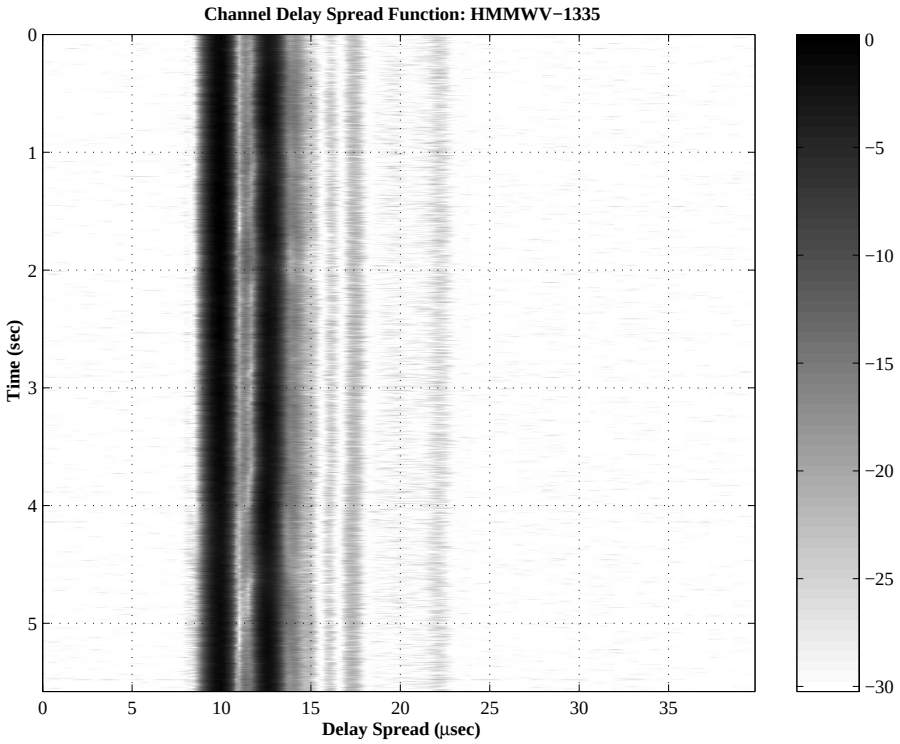

Figure 2.87: Channel delay spread function for hmmwv1335.

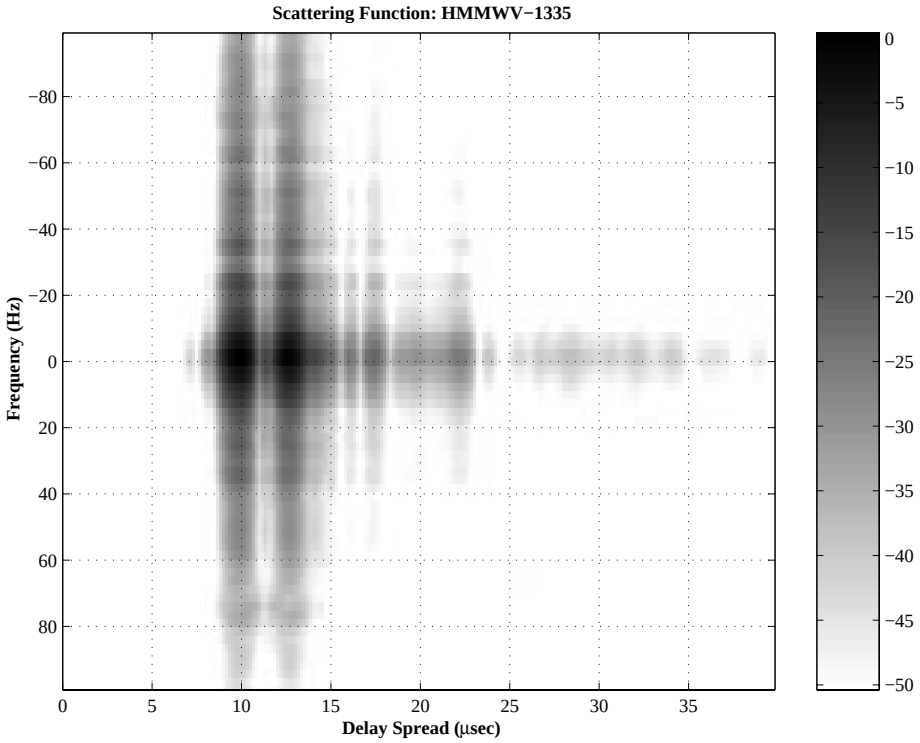

Figure 2.88: Scattering function for hmmwv1335.

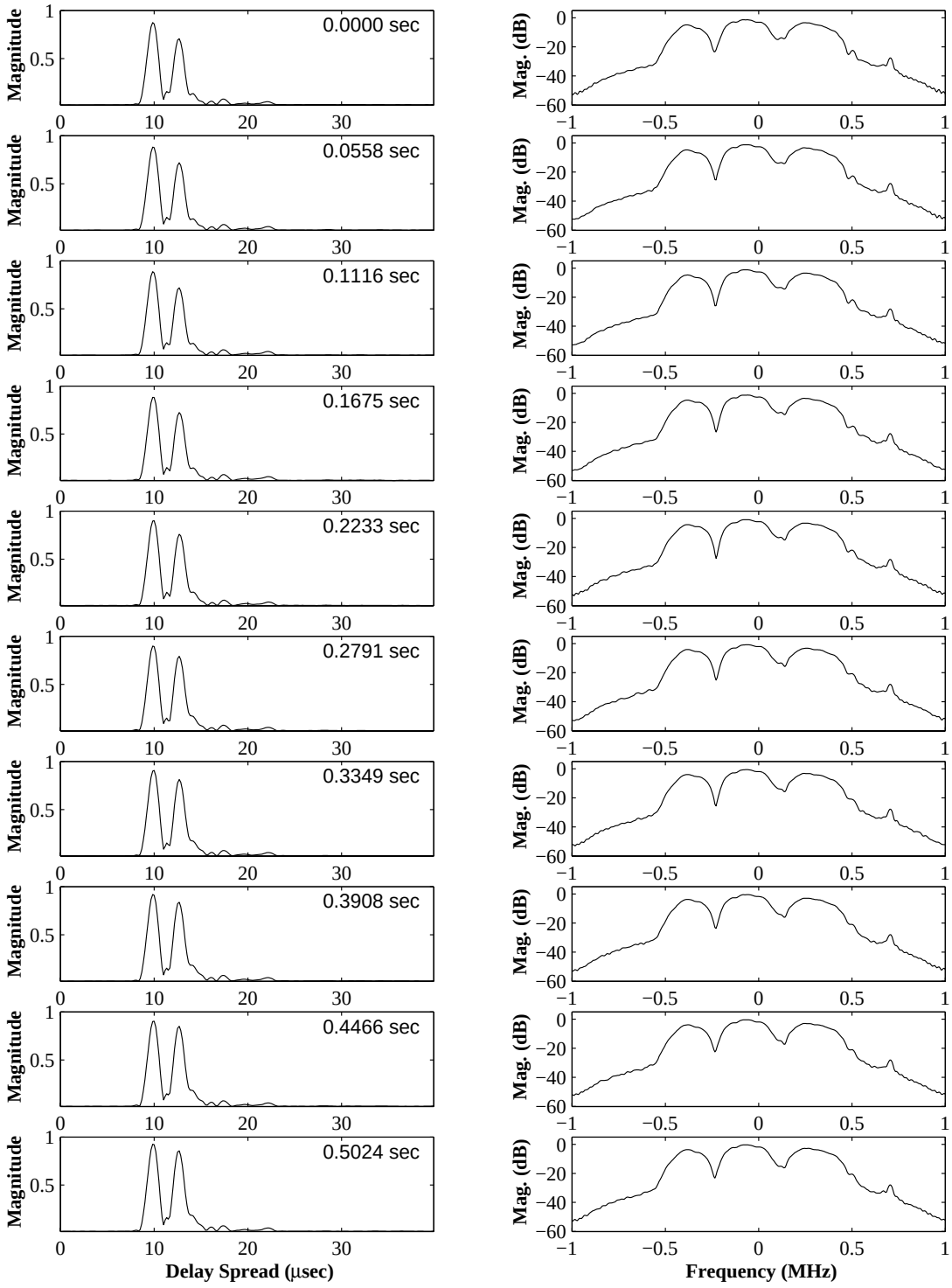

Figure 2.89: Local power delay profiles for hmmwv1335 (1).

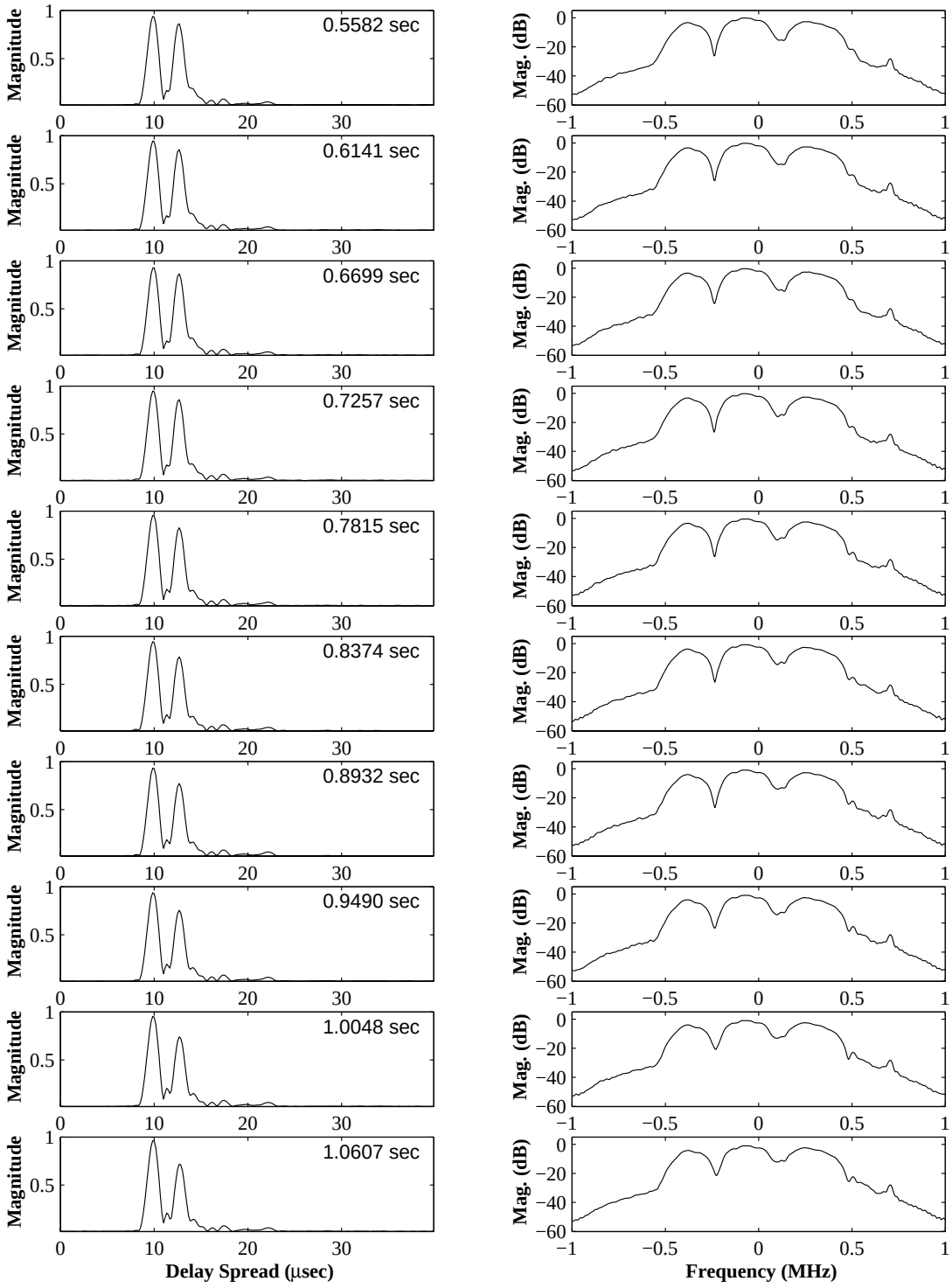

Figure 2.90: Local power delay profiles for hmmwv1335 (2).

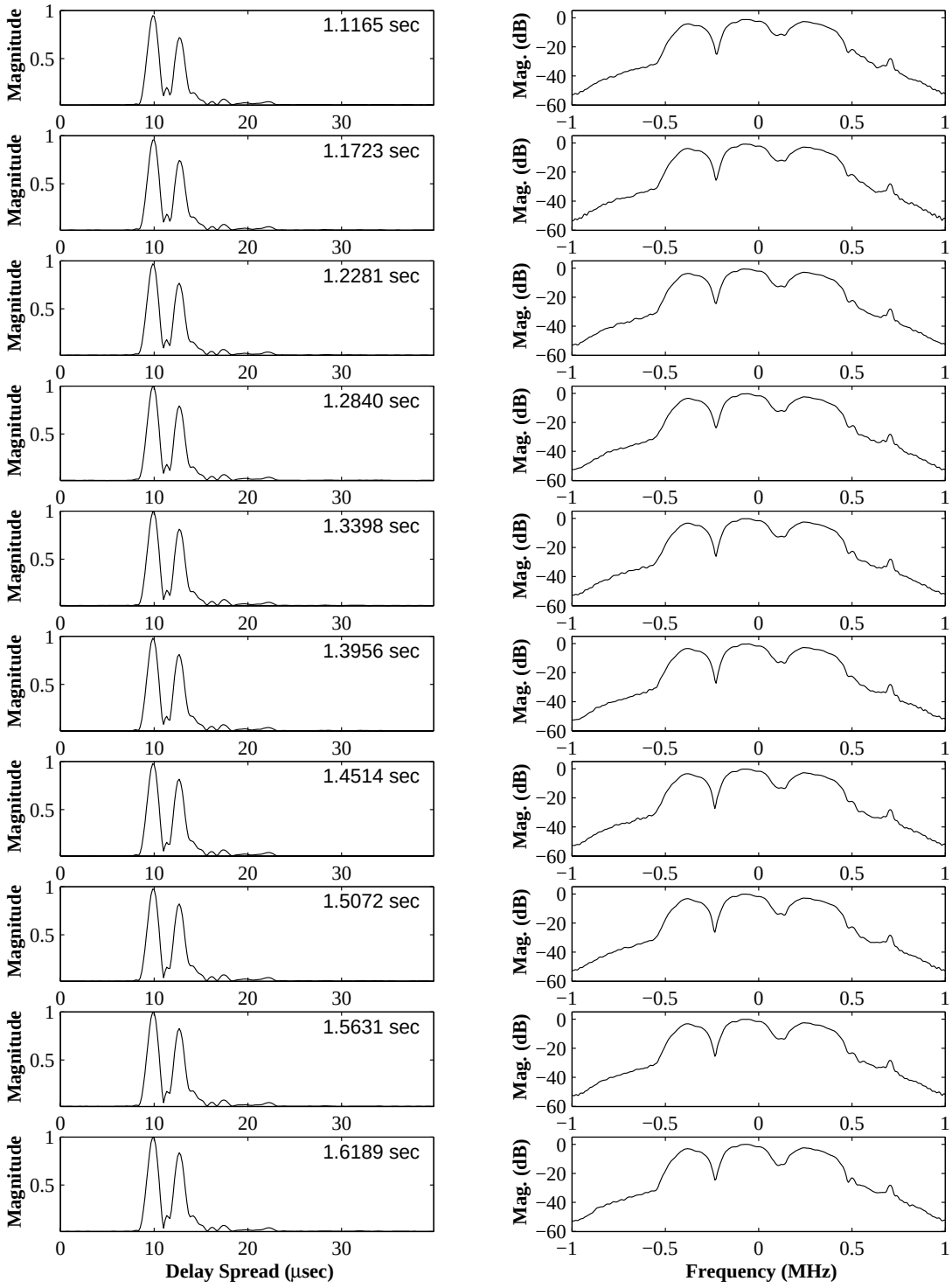

Figure 2.91: Local power delay profiles for hmmwv1335 (3).

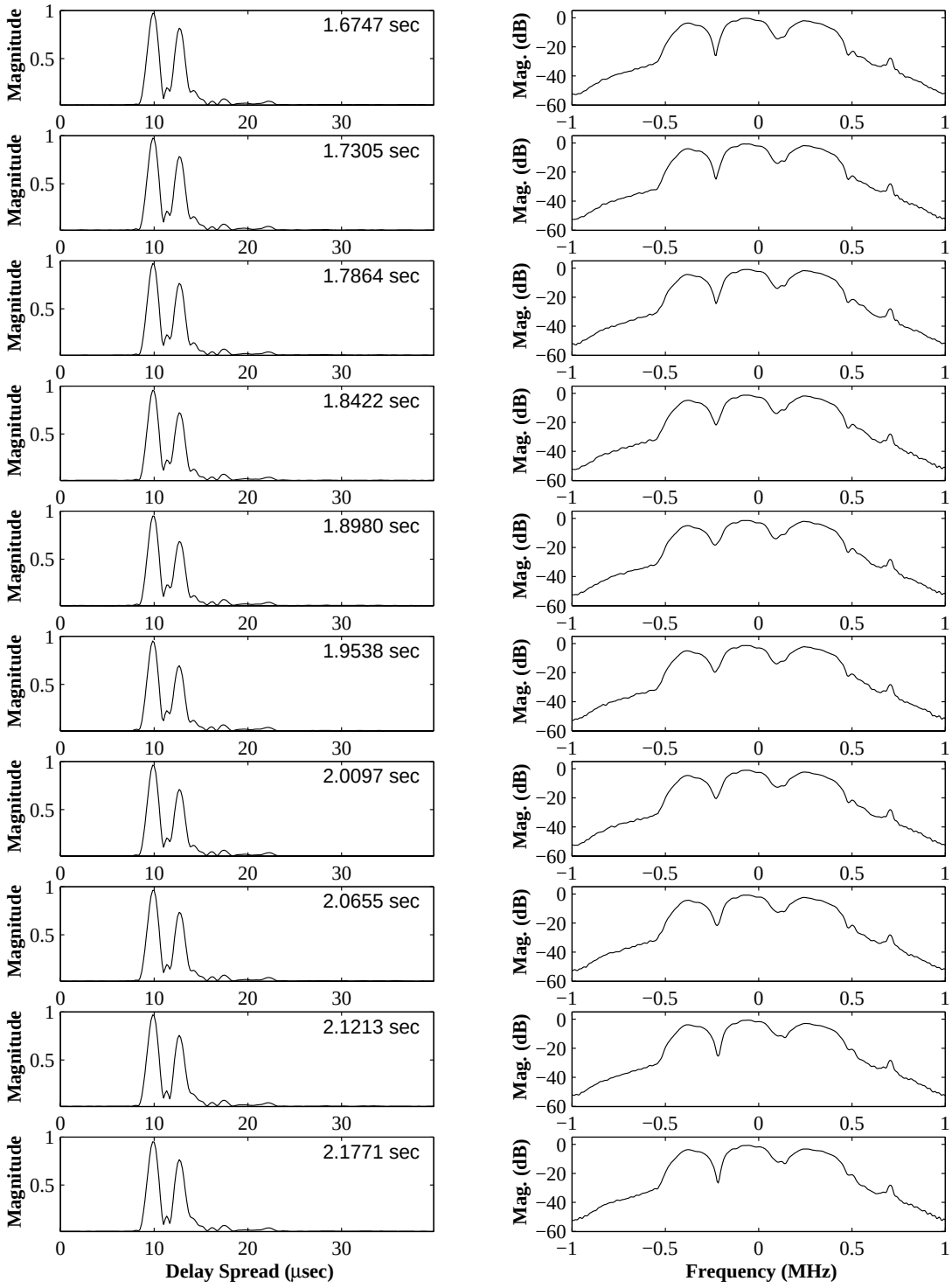

Figure 2.92: Local power delay profiles for hmmwv1335 (4).

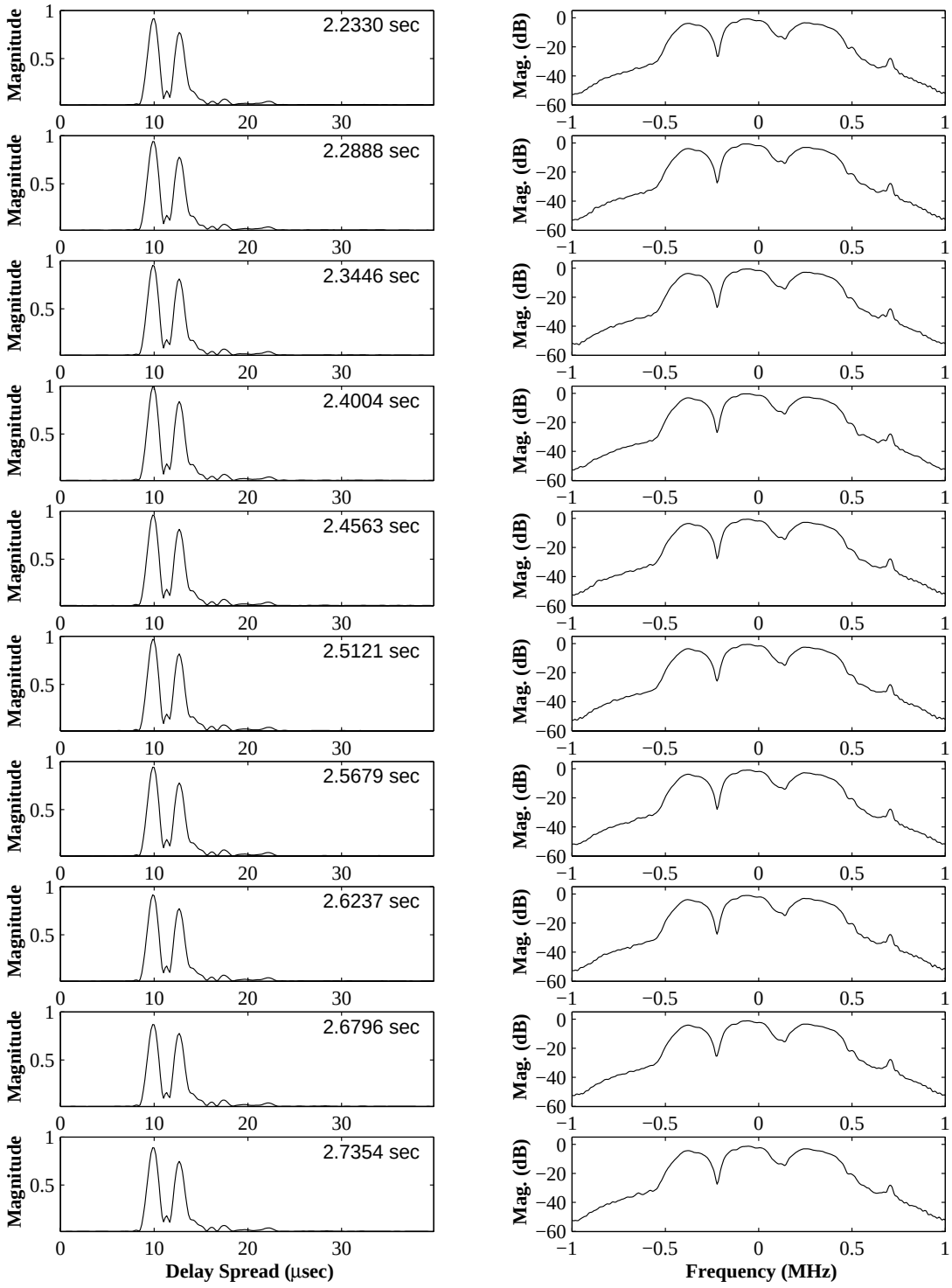

Figure 2.93: Local power delay profiles for hmmwv1335 (5).

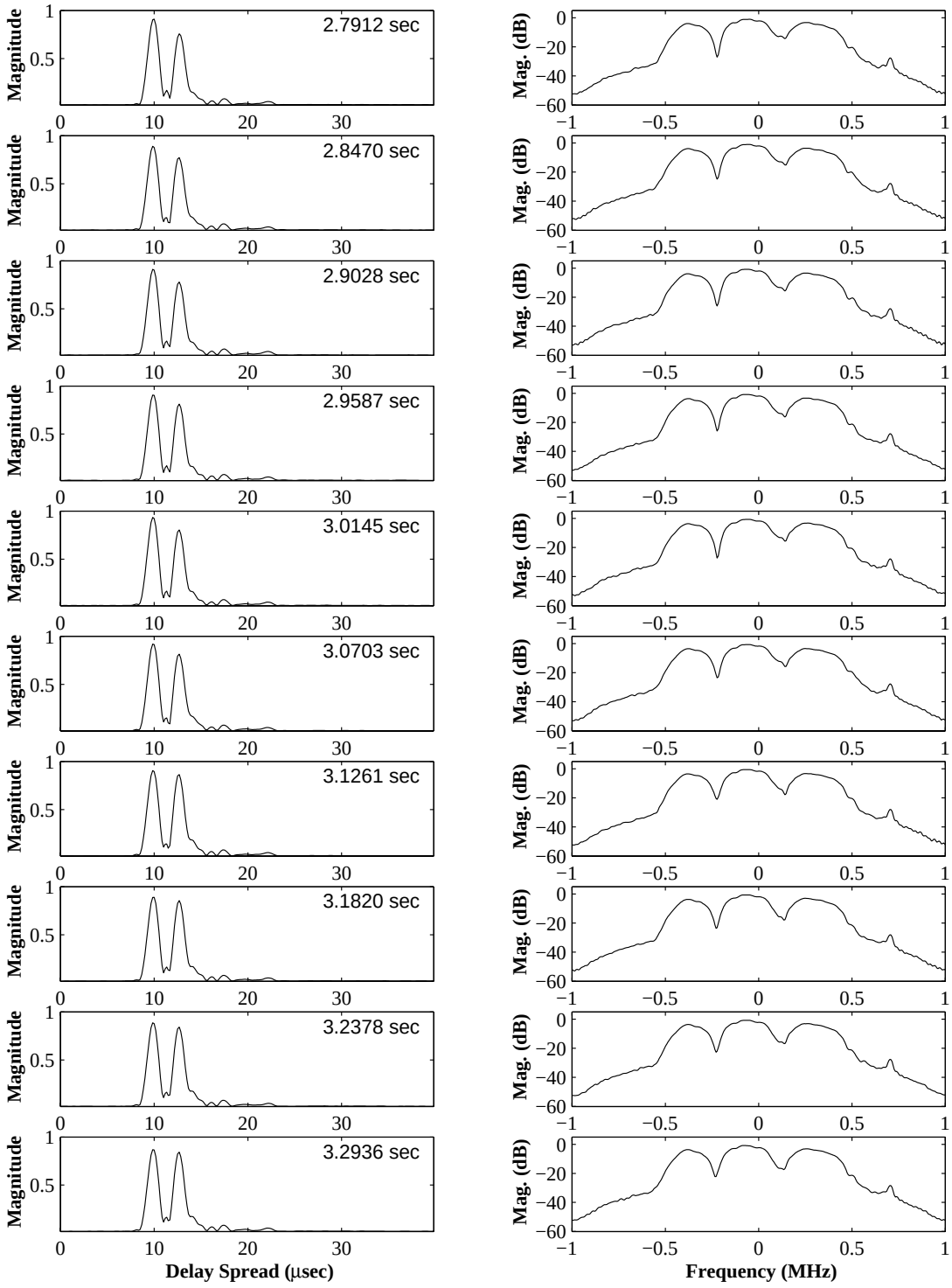

Figure 2.94: Local power delay profiles for hmmwv1335 (6).

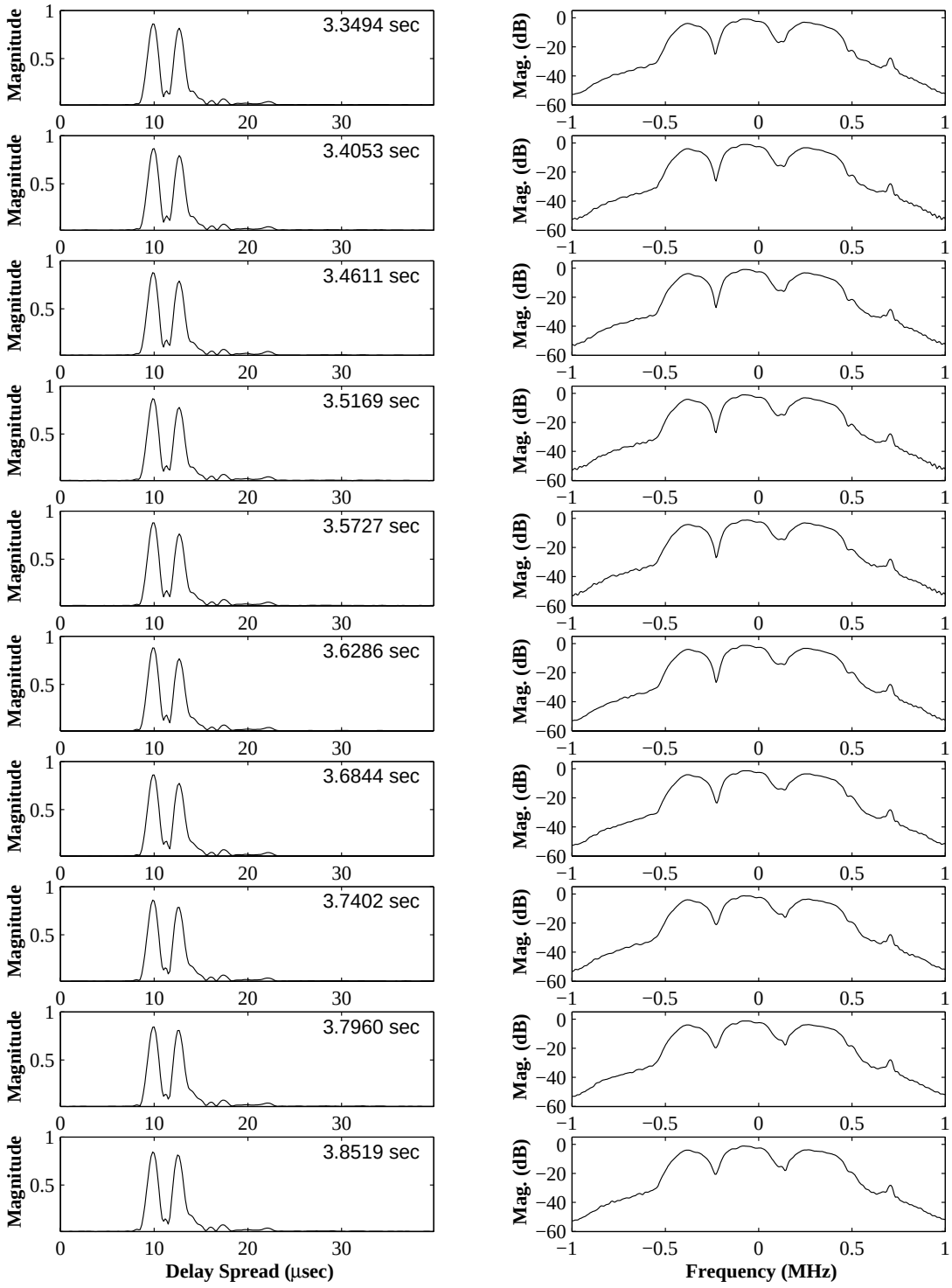

Figure 2.95: Local power delay profiles for hmmwv1335 (7).

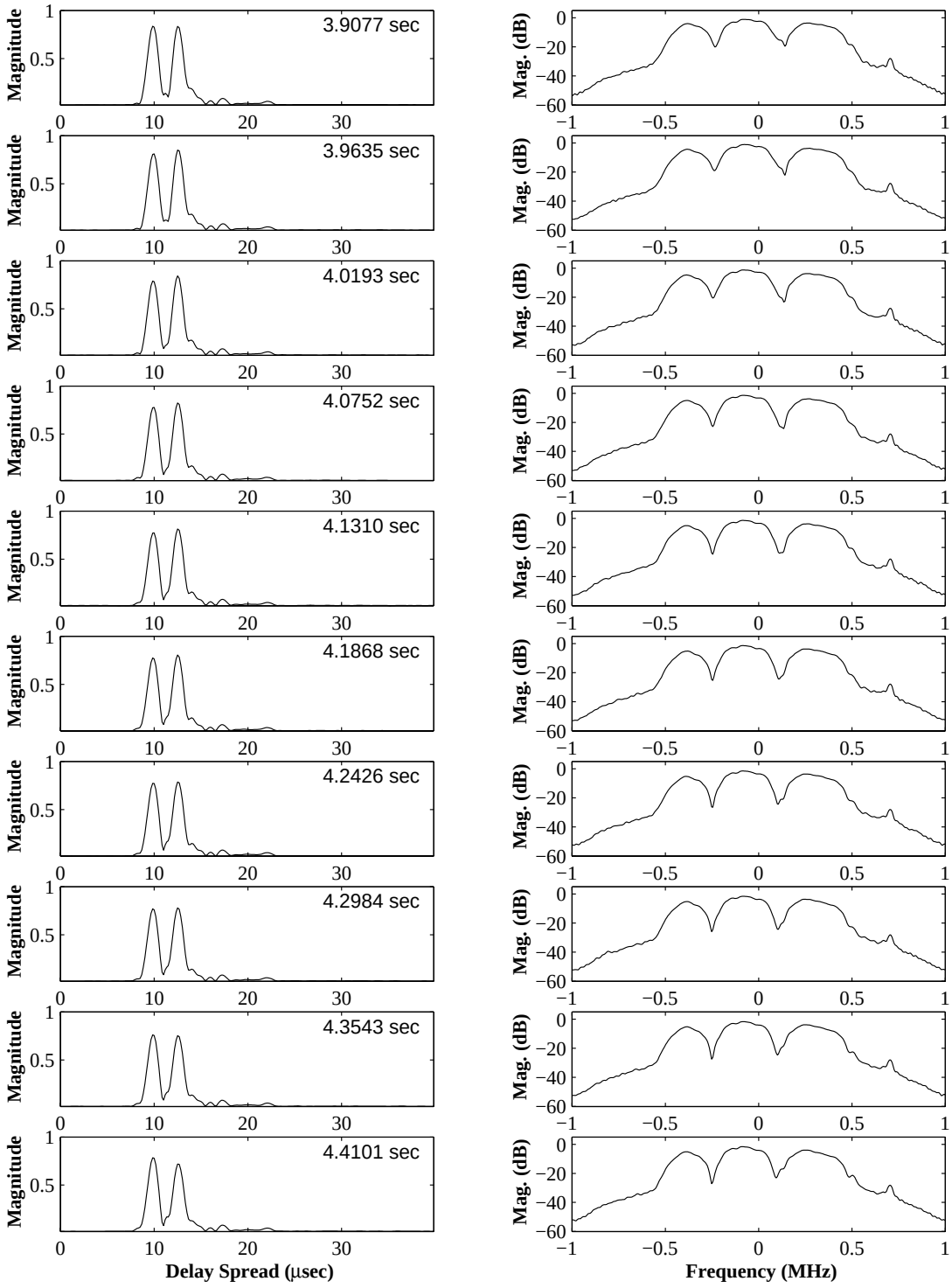

Figure 2.96: Local power delay profiles for hmmwv1335 (8).

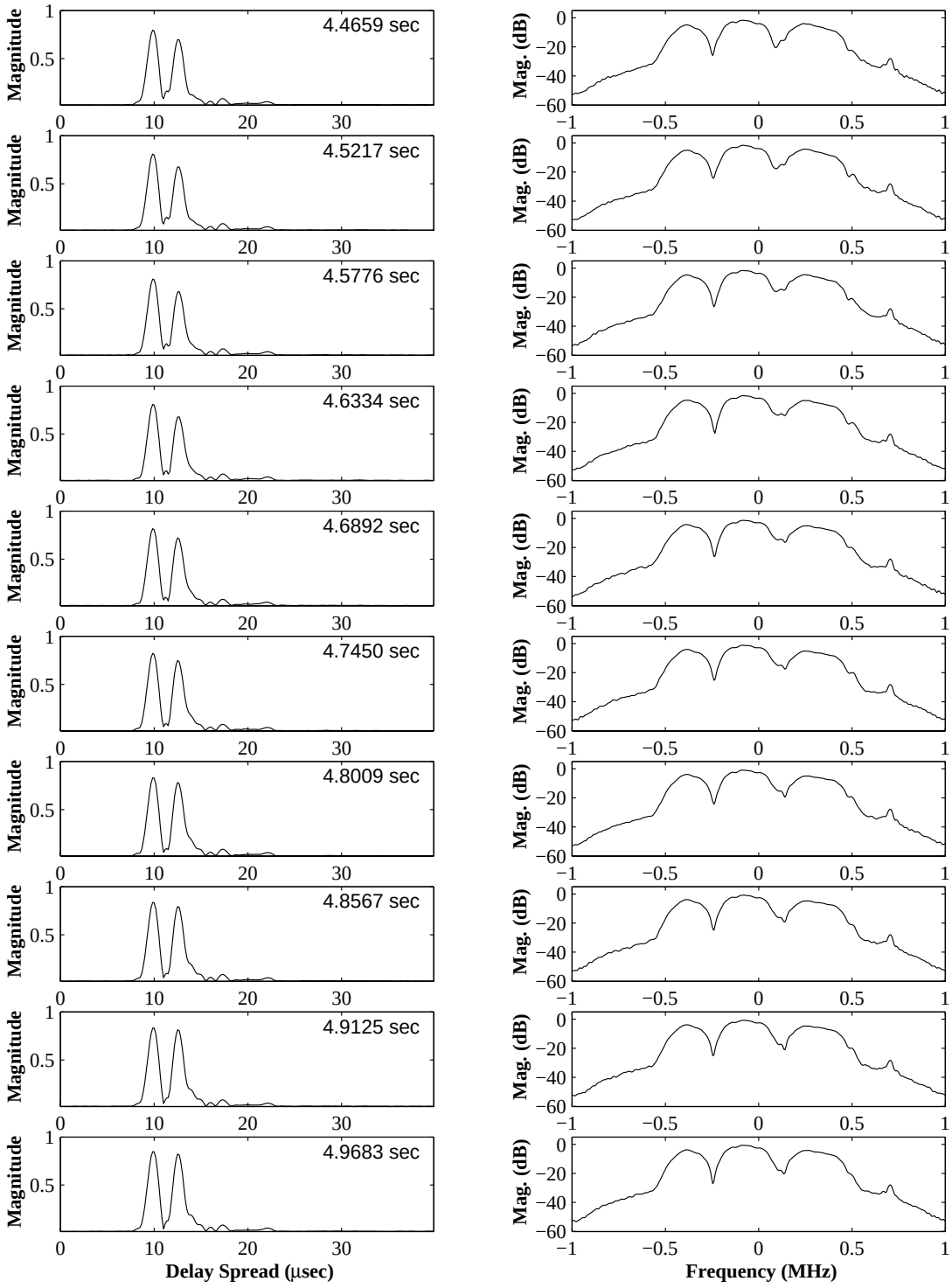

Figure 2.97: Local power delay profiles for hmmwv1335 (9).

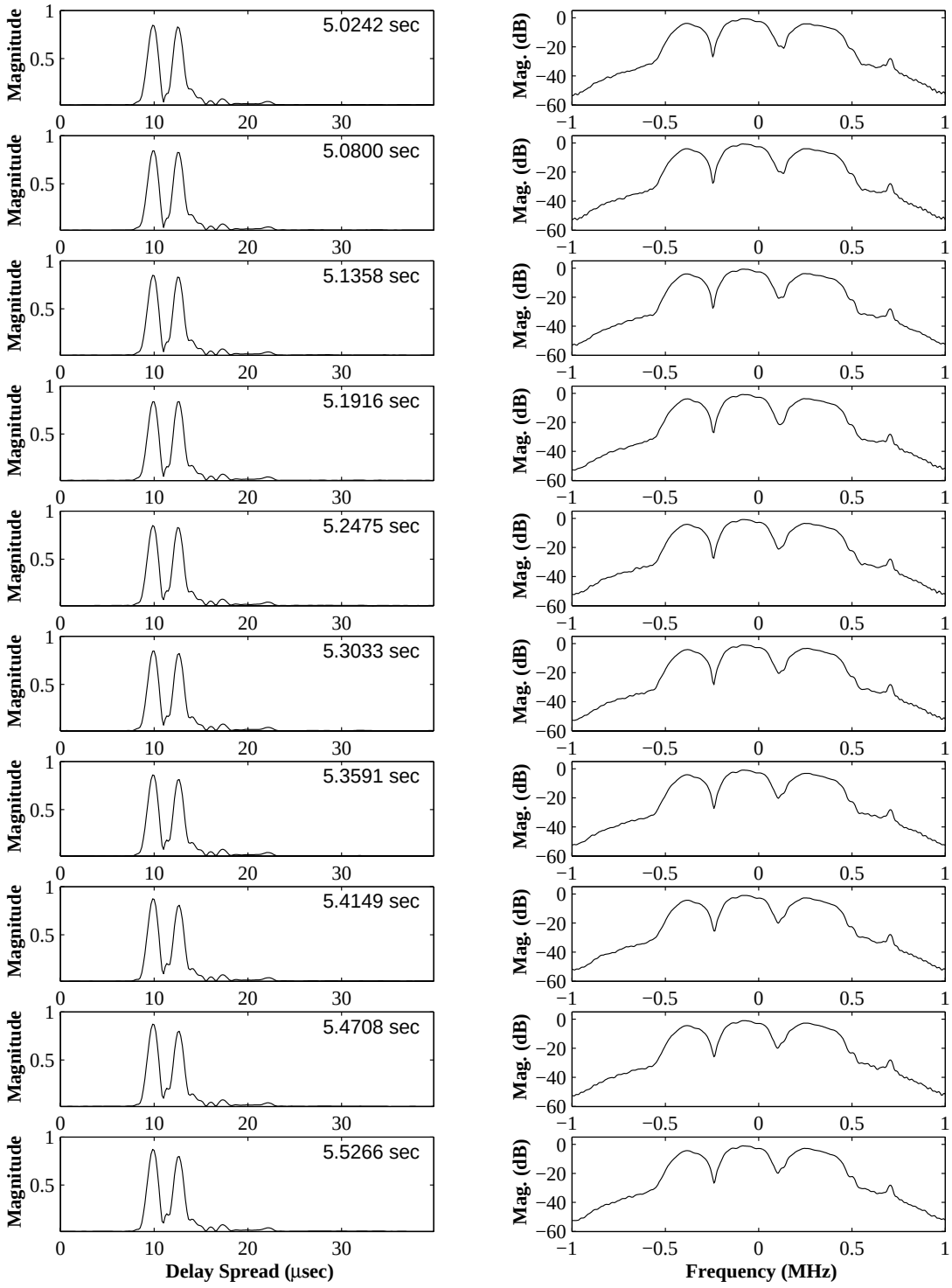

Figure 2.98: Local power delay profiles for hmmwv1335 (10).

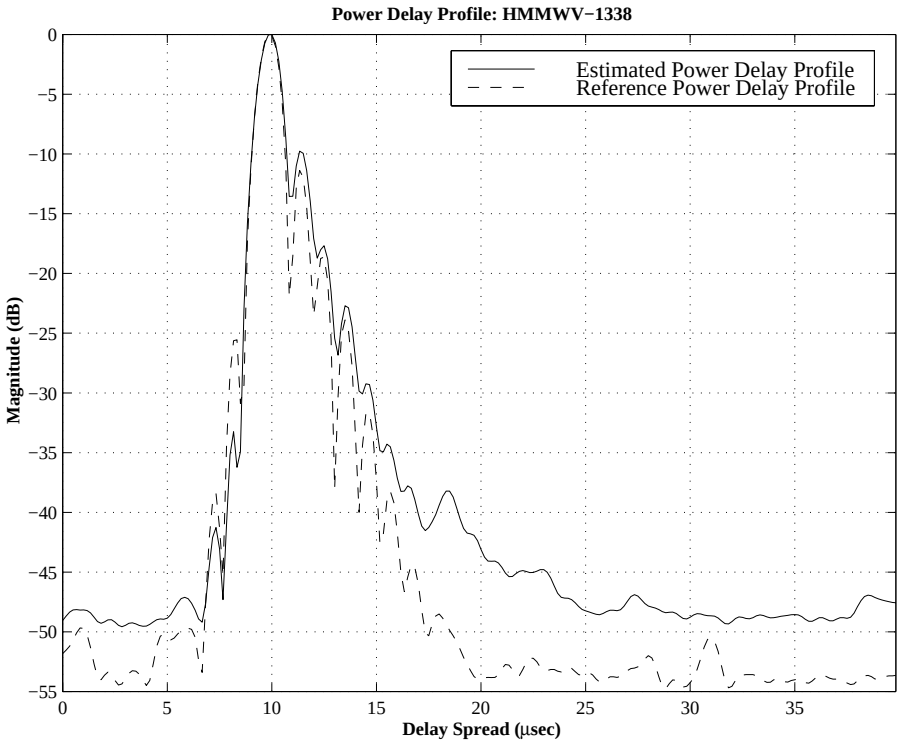

Figure 2.99: Power delay profile for hmmwv1338.

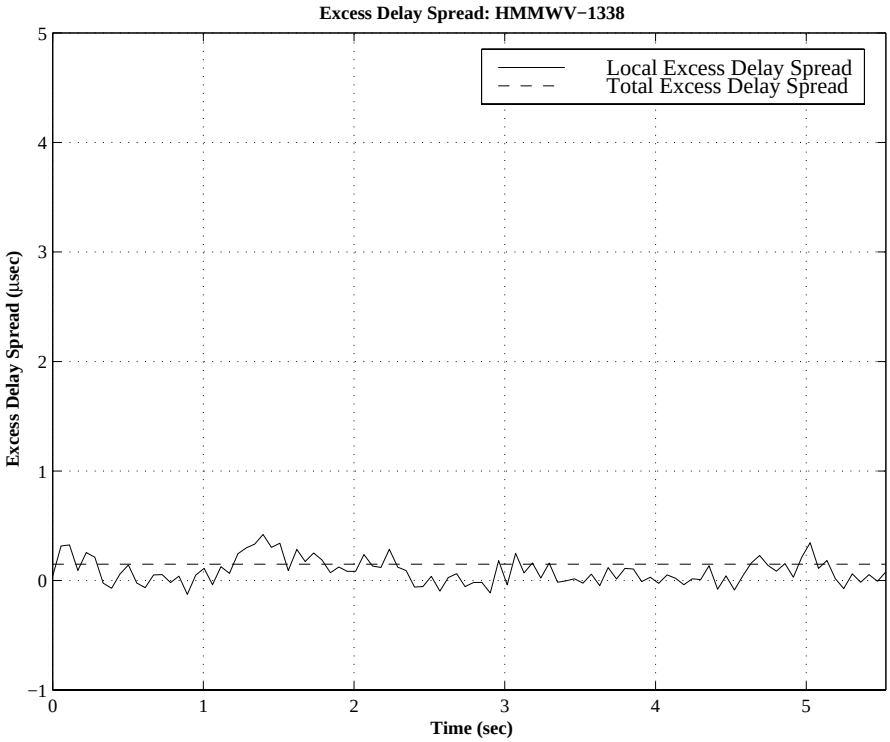

Figure 2.100: Excess delay spread for hmmwv1338.

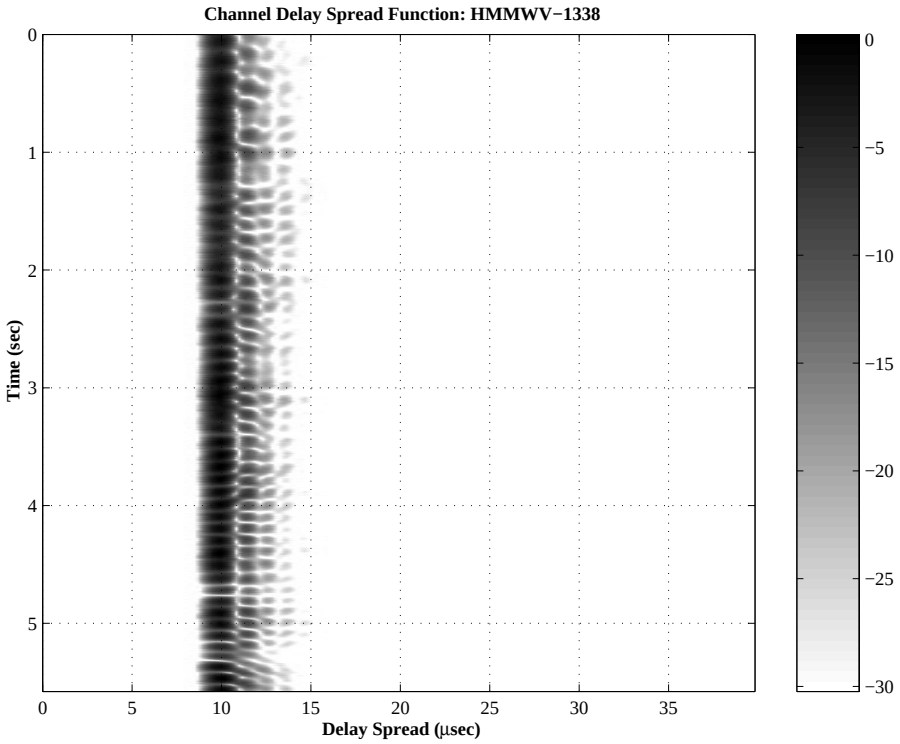

Figure 2.101: Channel delay spread function for hmmwv1338.

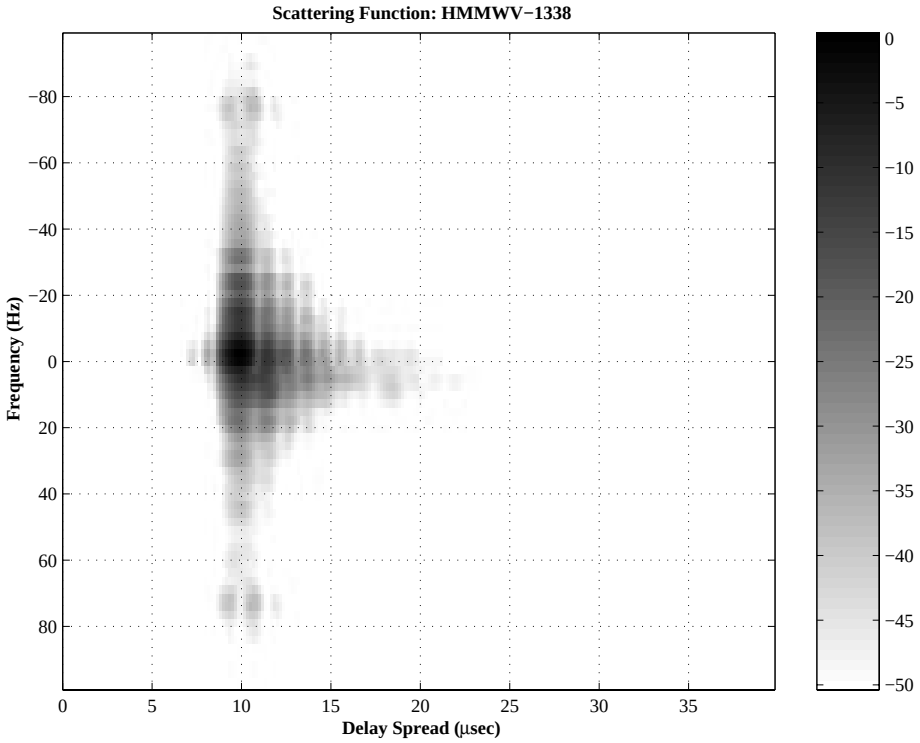

Figure 2.102: Scattering function for hmmwv1338.

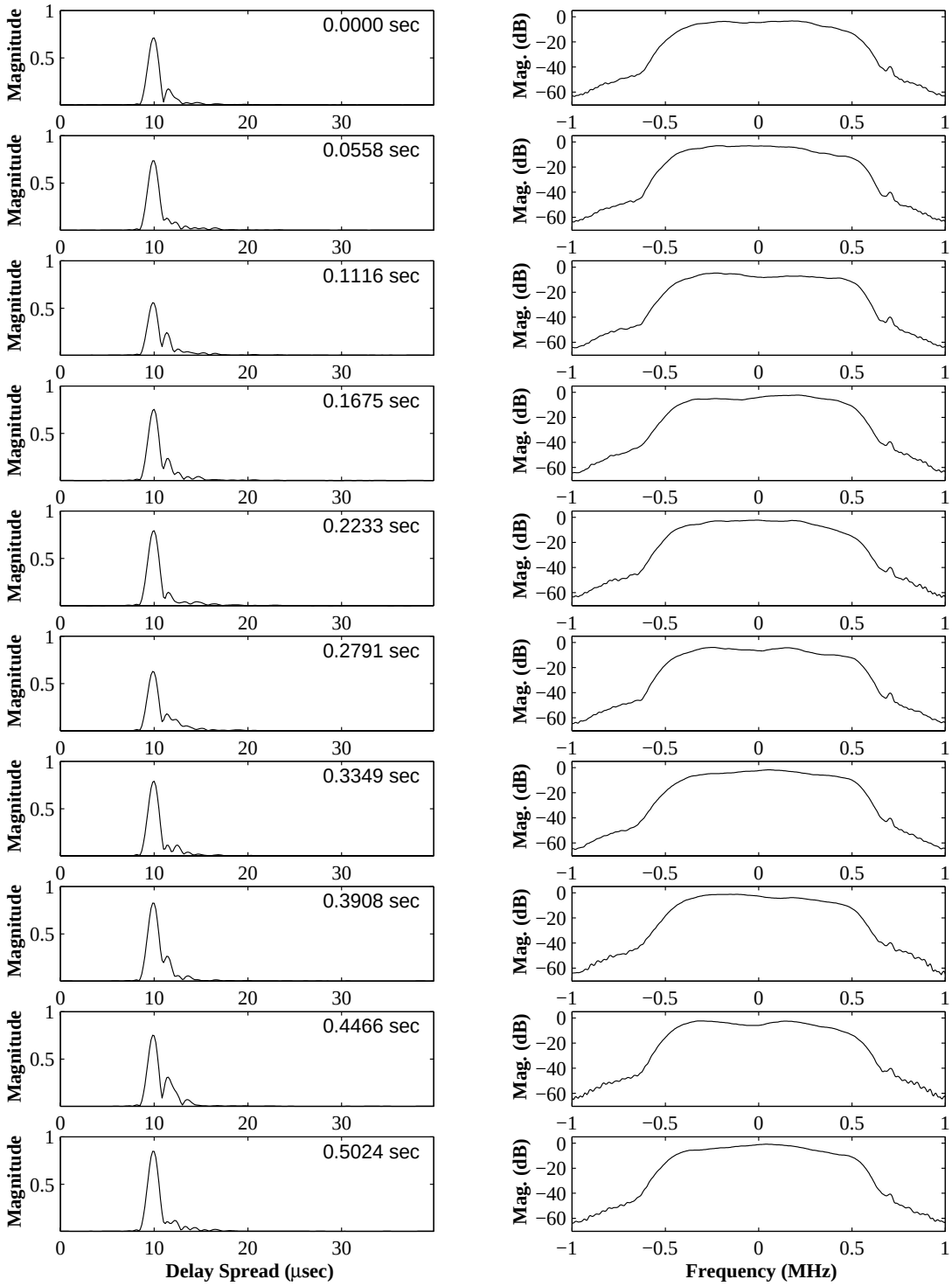

Figure 2.103: Local power delay profiles for hmmwv1338 (1).

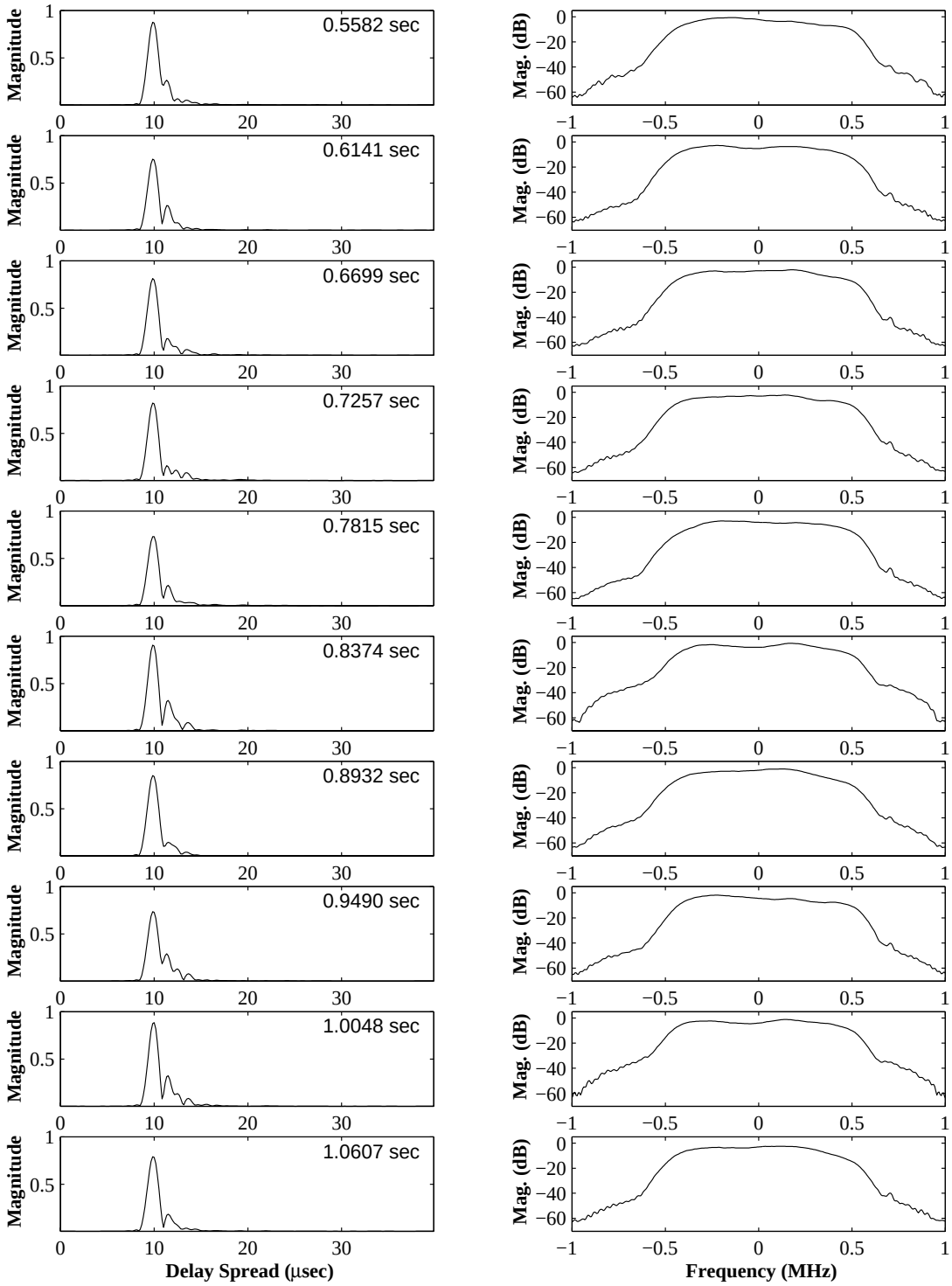

Figure 2.104: Local power delay profiles for hmmwv1338 (2).

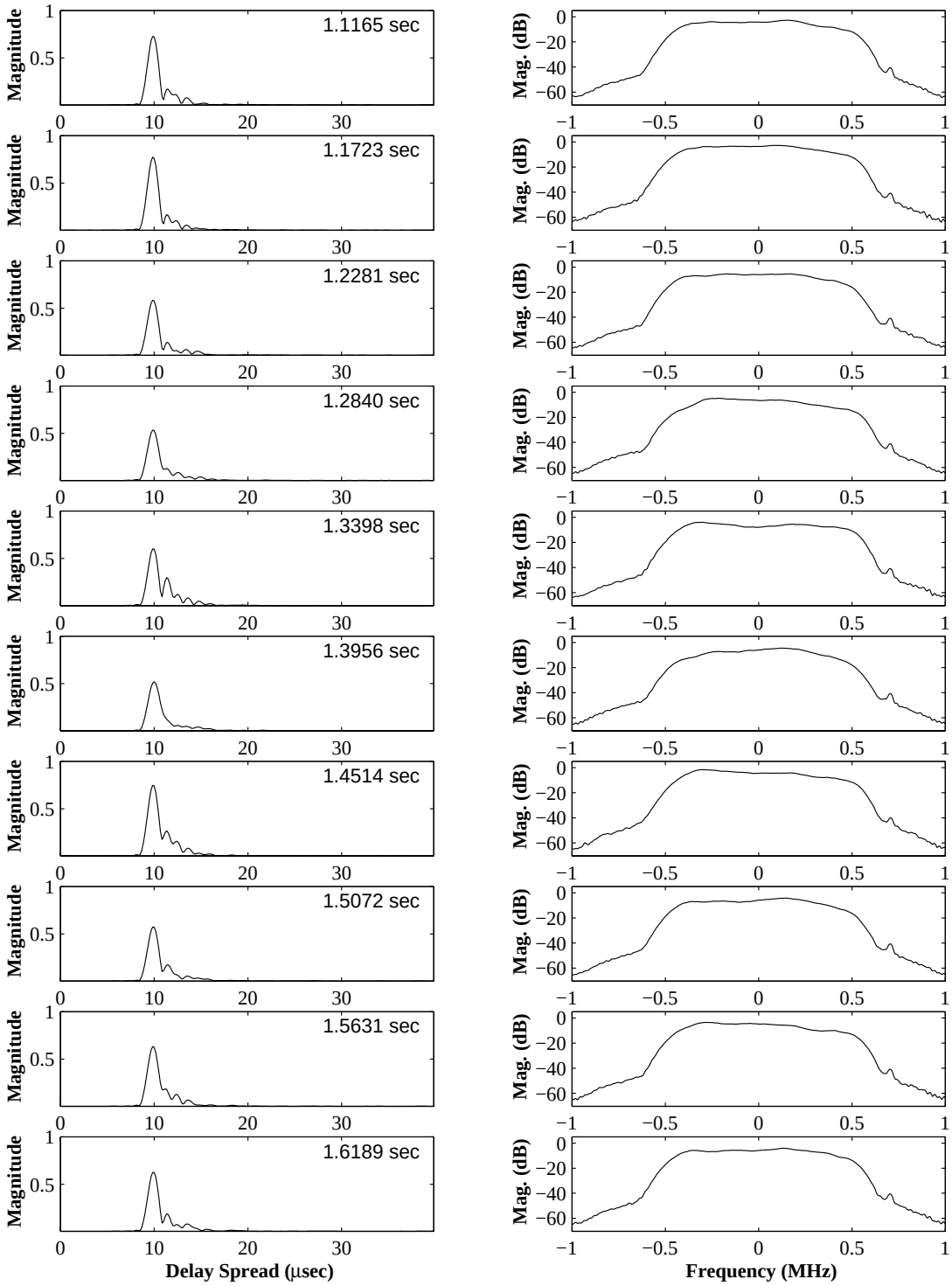

Figure 2.105: Local power delay profiles for hmmwv1338 (3).

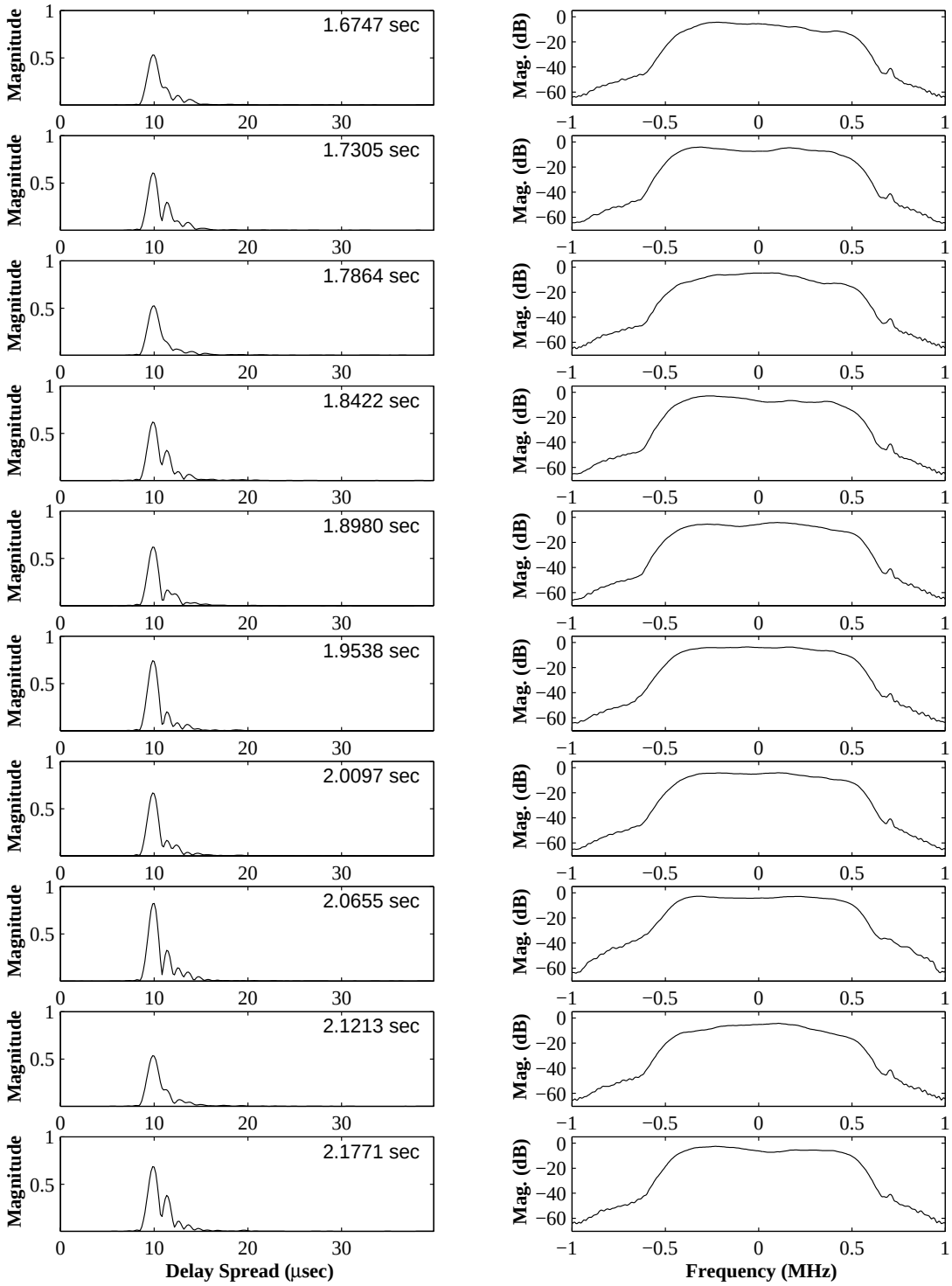

Figure 2.106: Local power delay profiles for hmmwv1338 (4).

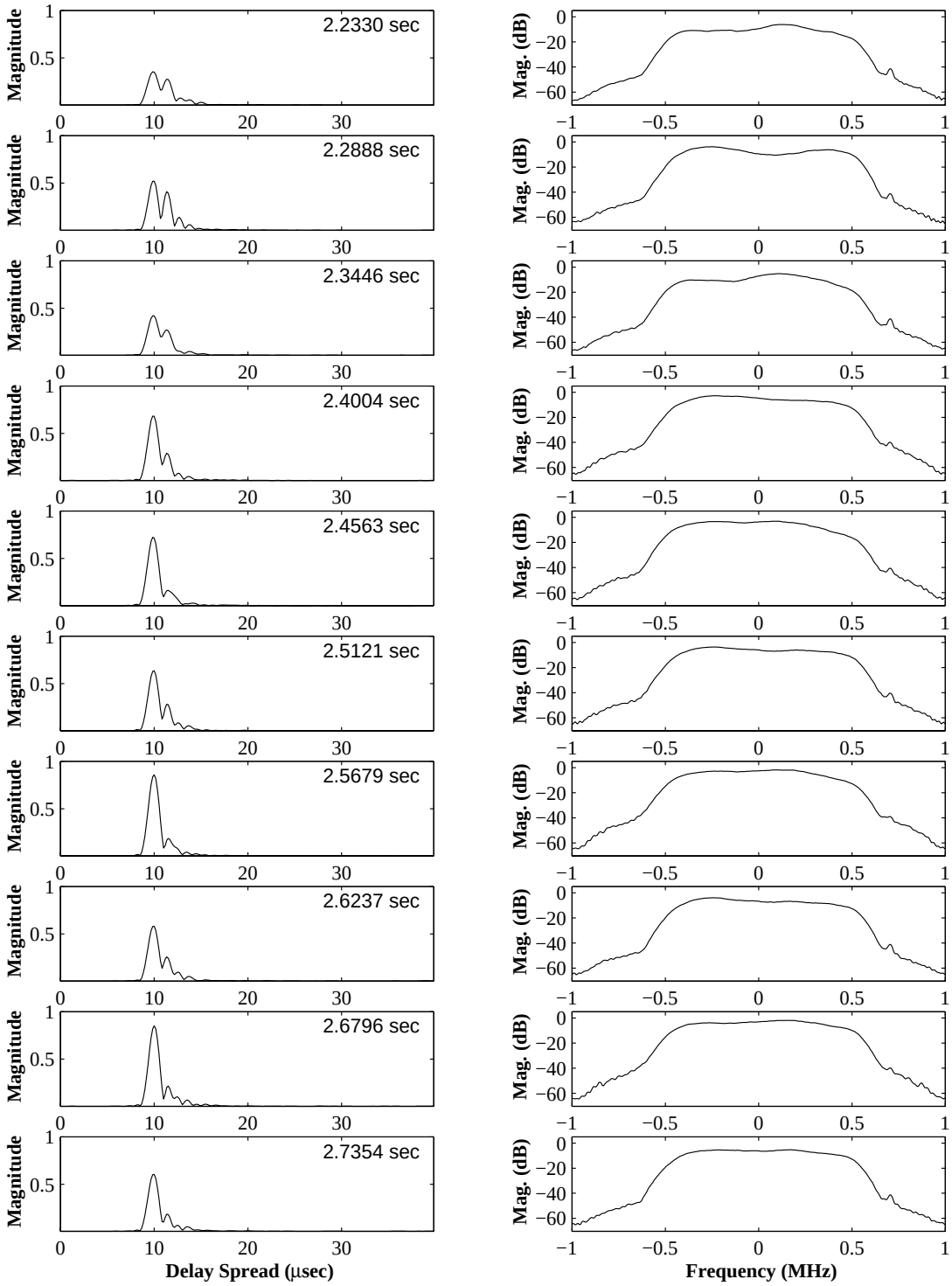

Figure 2.107: Local power delay profiles for hmmwv1338 (5).

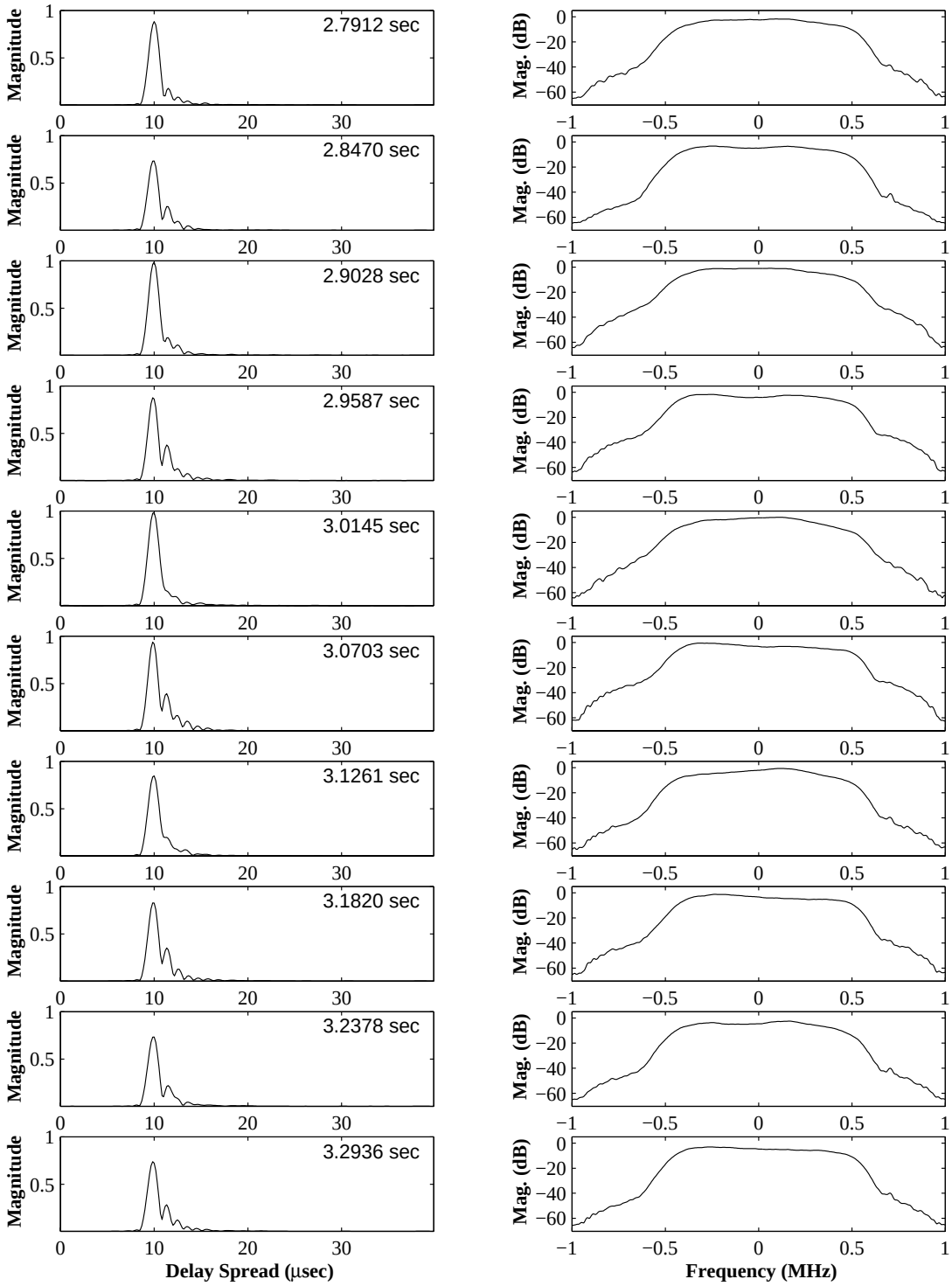

Figure 2.108: Local power delay profiles for hmmwv1338 (6).

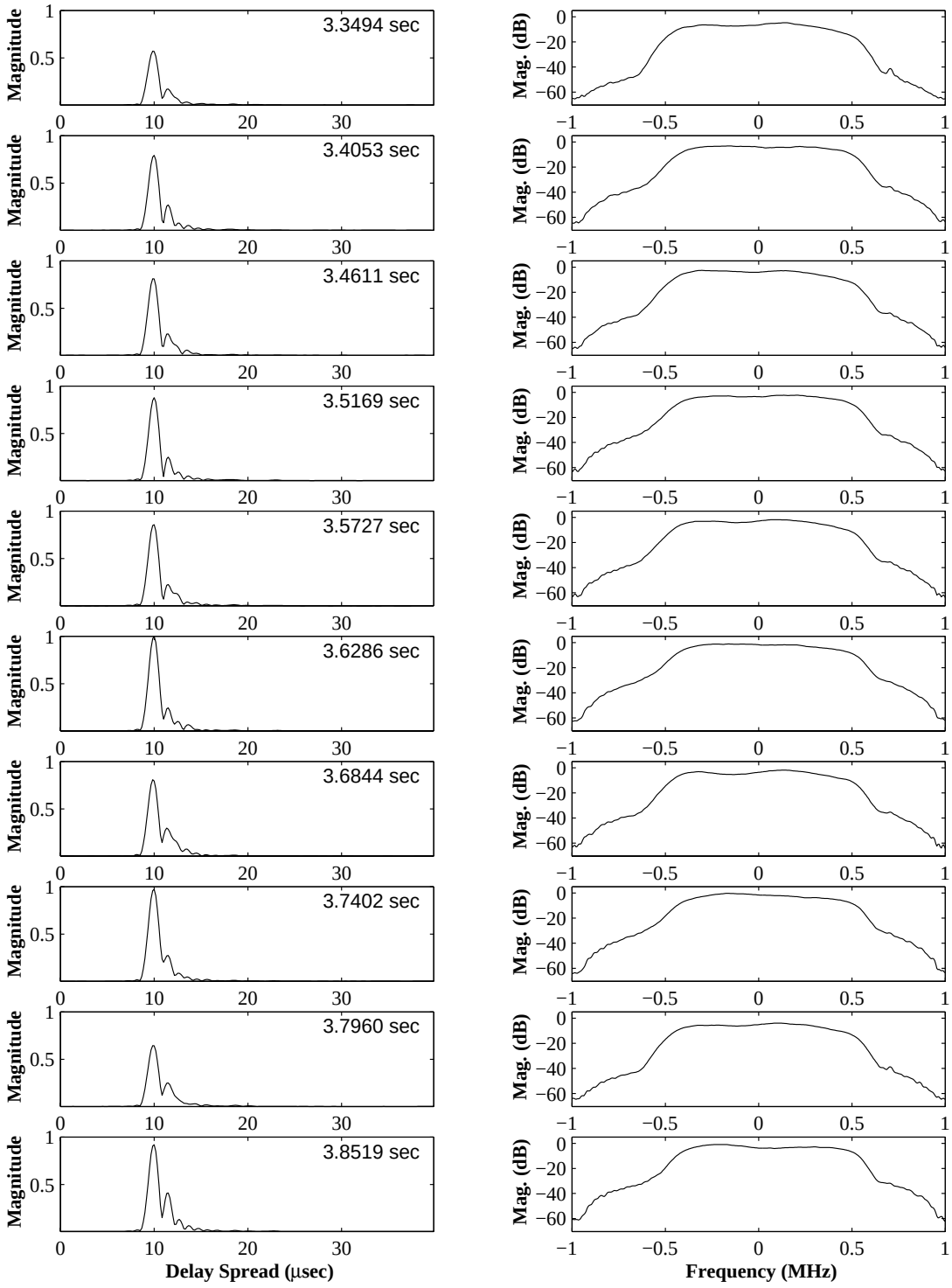

Figure 2.109: Local power delay profiles for hmmwv1338 (7).

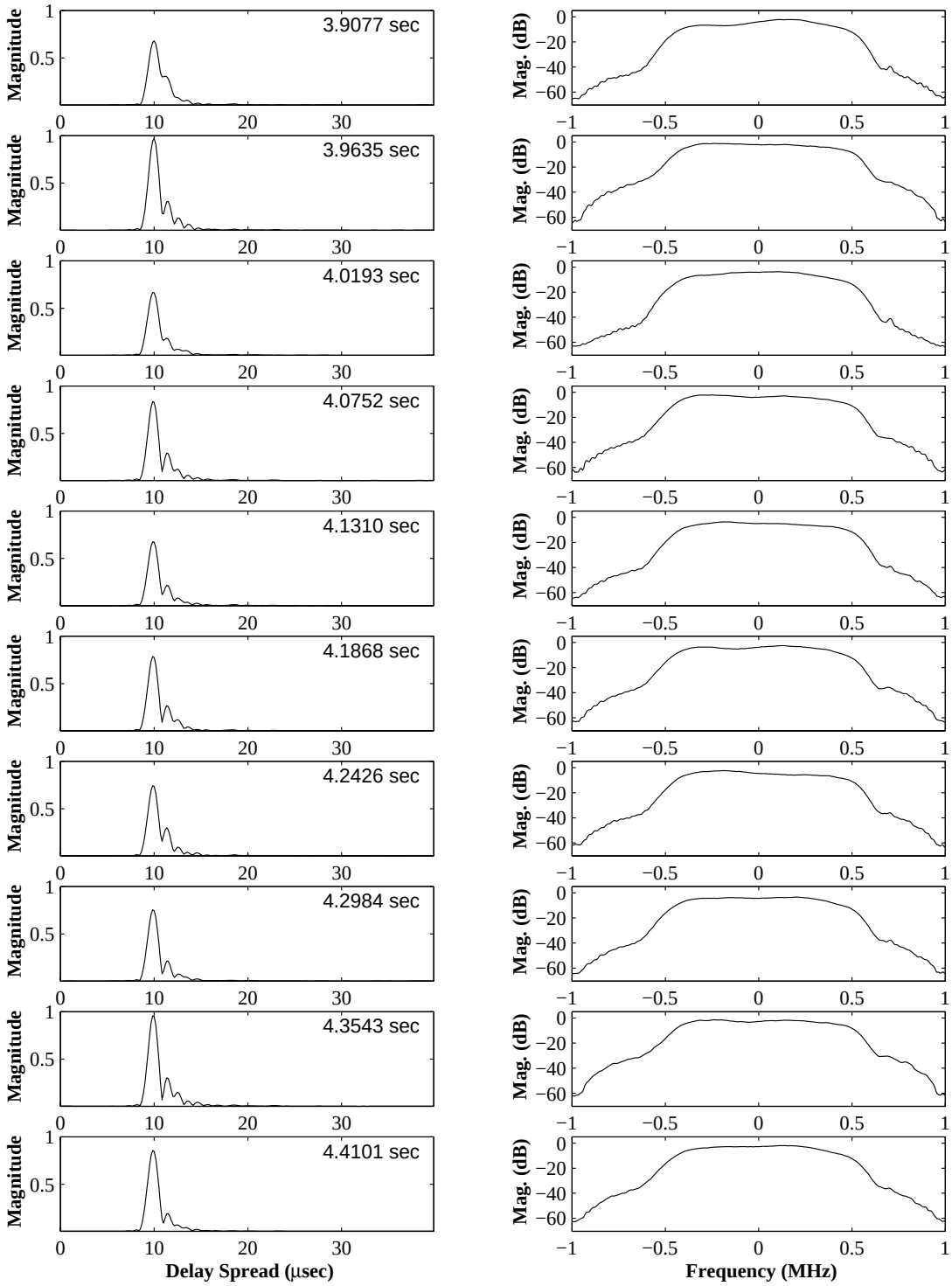

Figure 2.110: Local power delay profiles for hmmwv1338 (8).

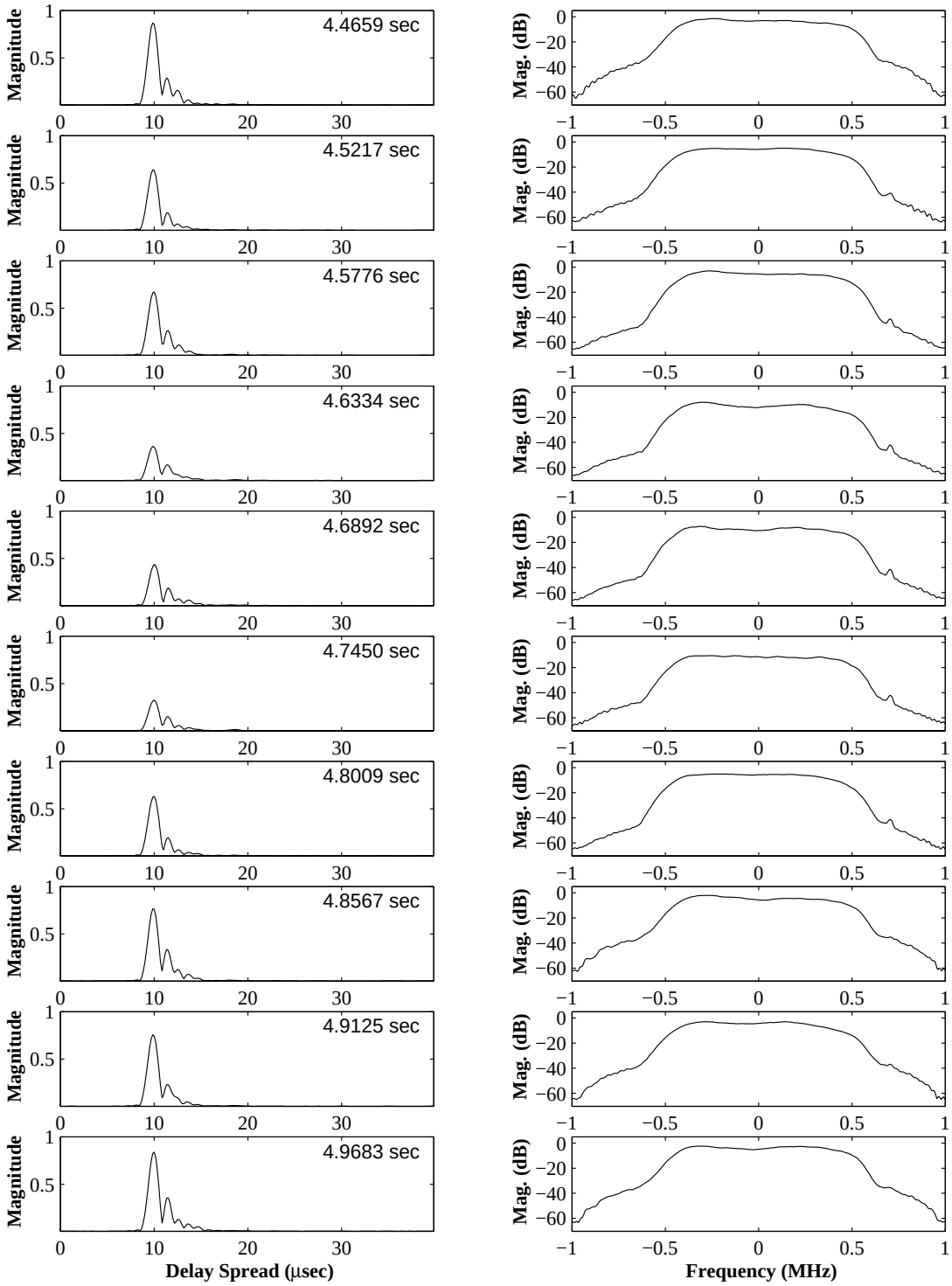

Figure 2.111: Local power delay profiles for hmmwv1338 (9).

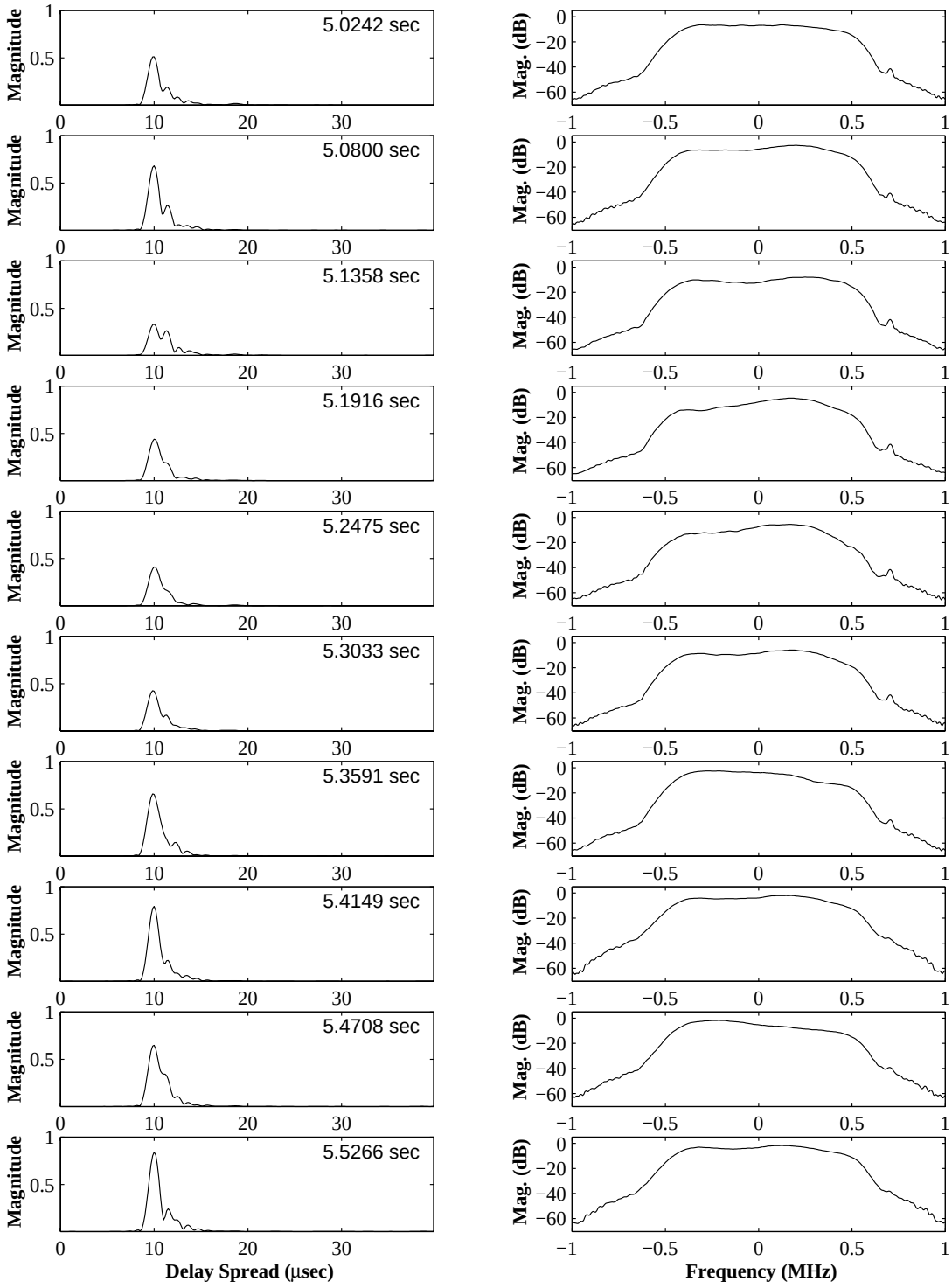

Figure 2.112: Local power delay profiles for hmmwv1338 (10).

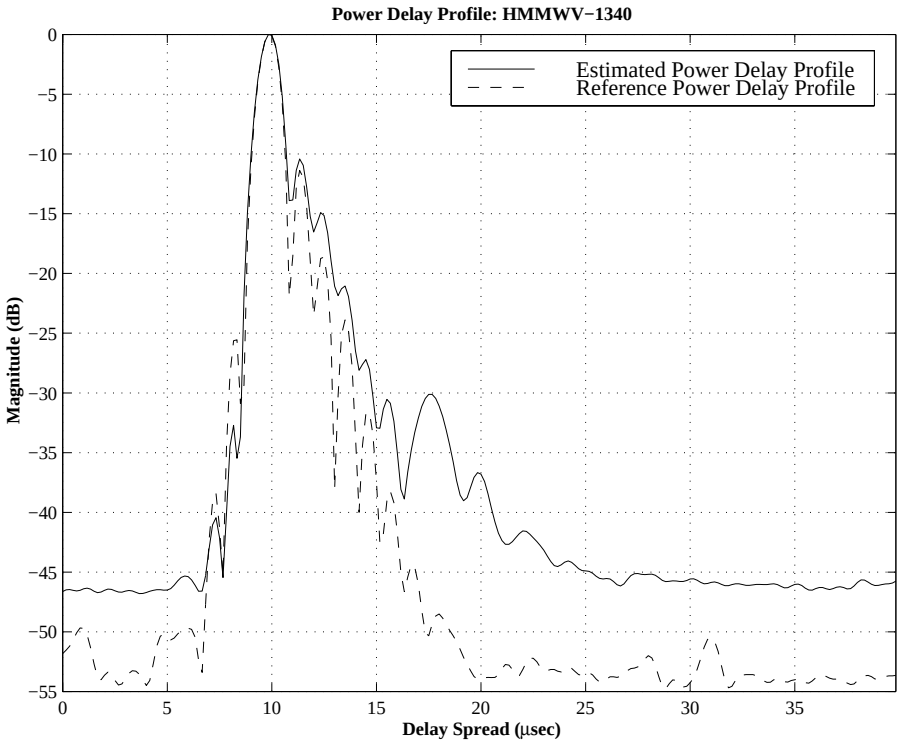

Figure 2.113: Power delay profile for hmmwv1340.

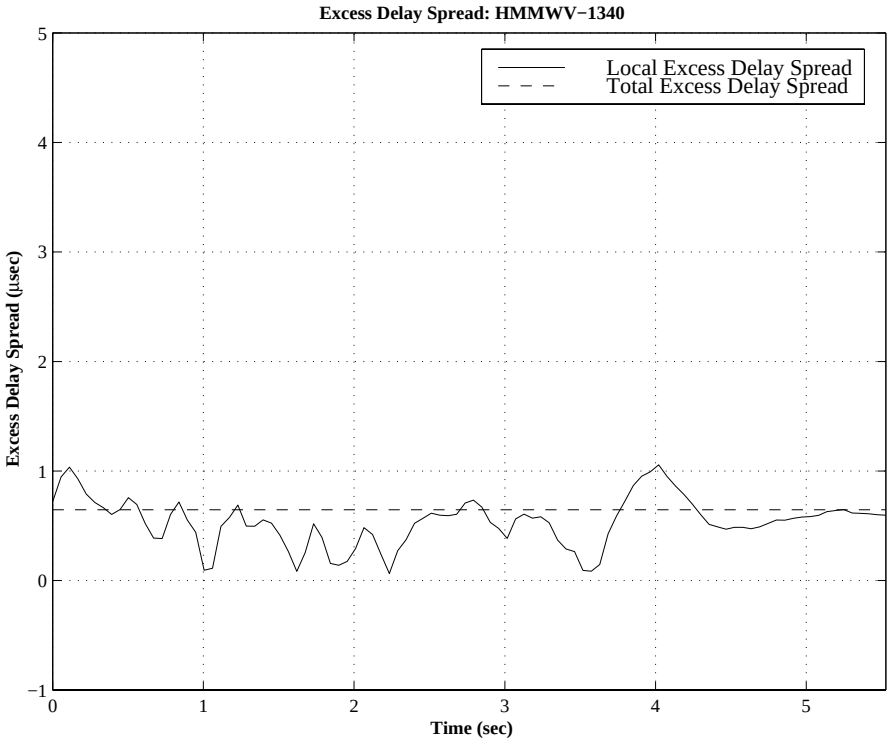

Figure 2.114: Excess delay spread for hmmwv1340.

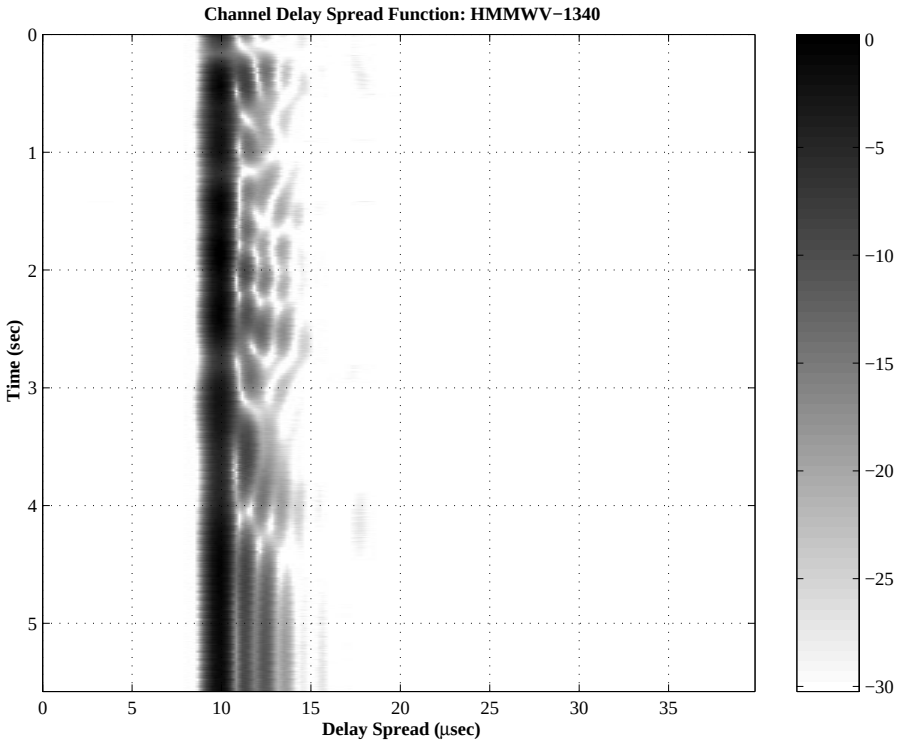

Figure 2.115: Channel delay spread function for hmmwv1340.

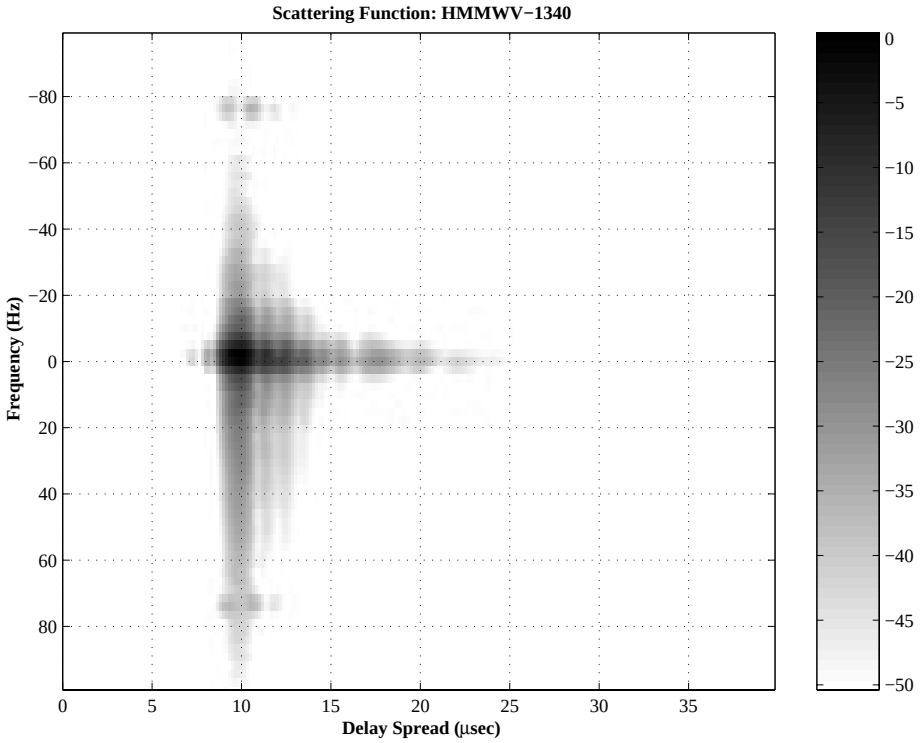

Figure 2.116: Scattering function for hmmwv1340.

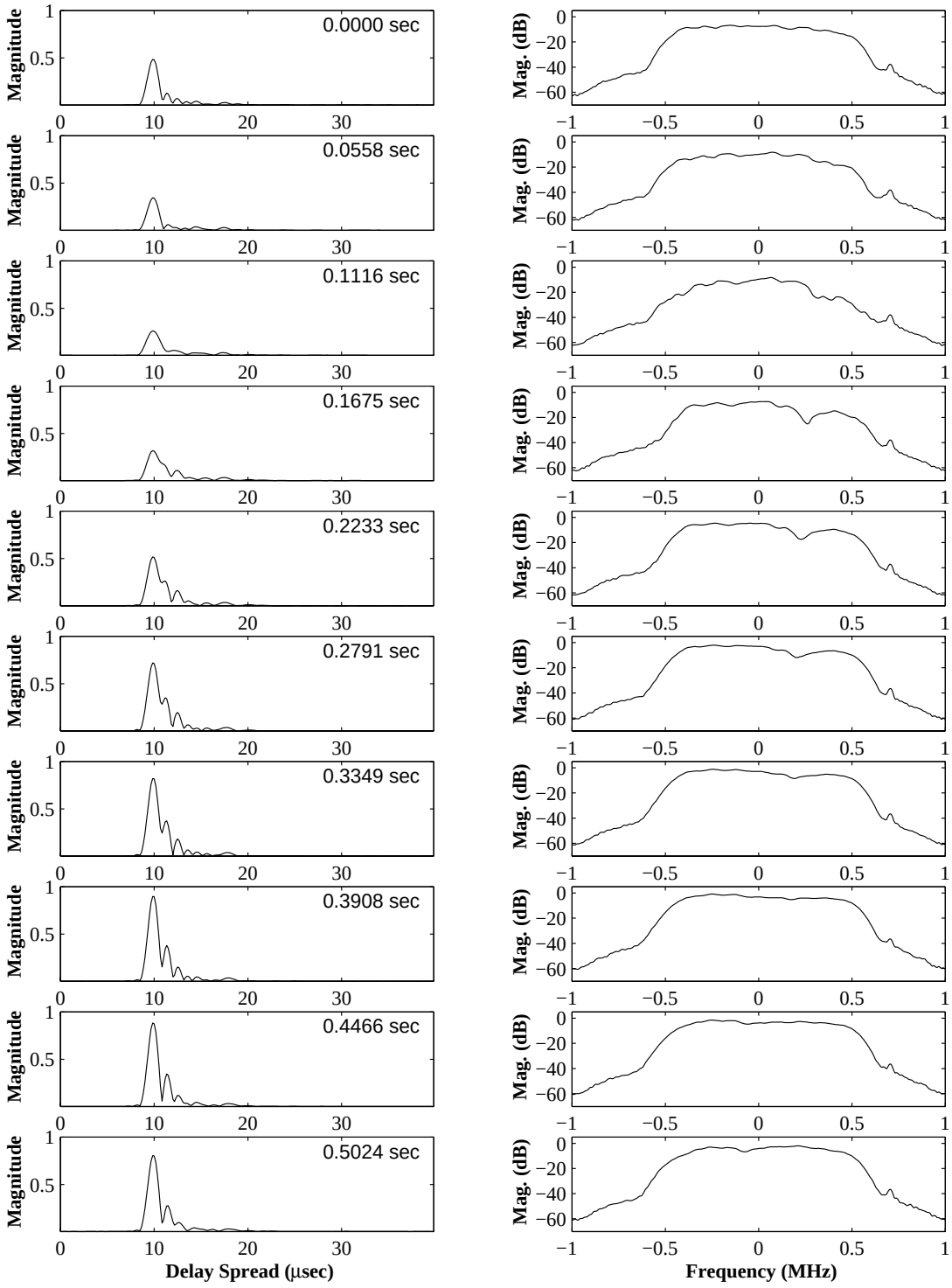

Figure 2.117: Local power delay profiles for hmmwv1340 (1).

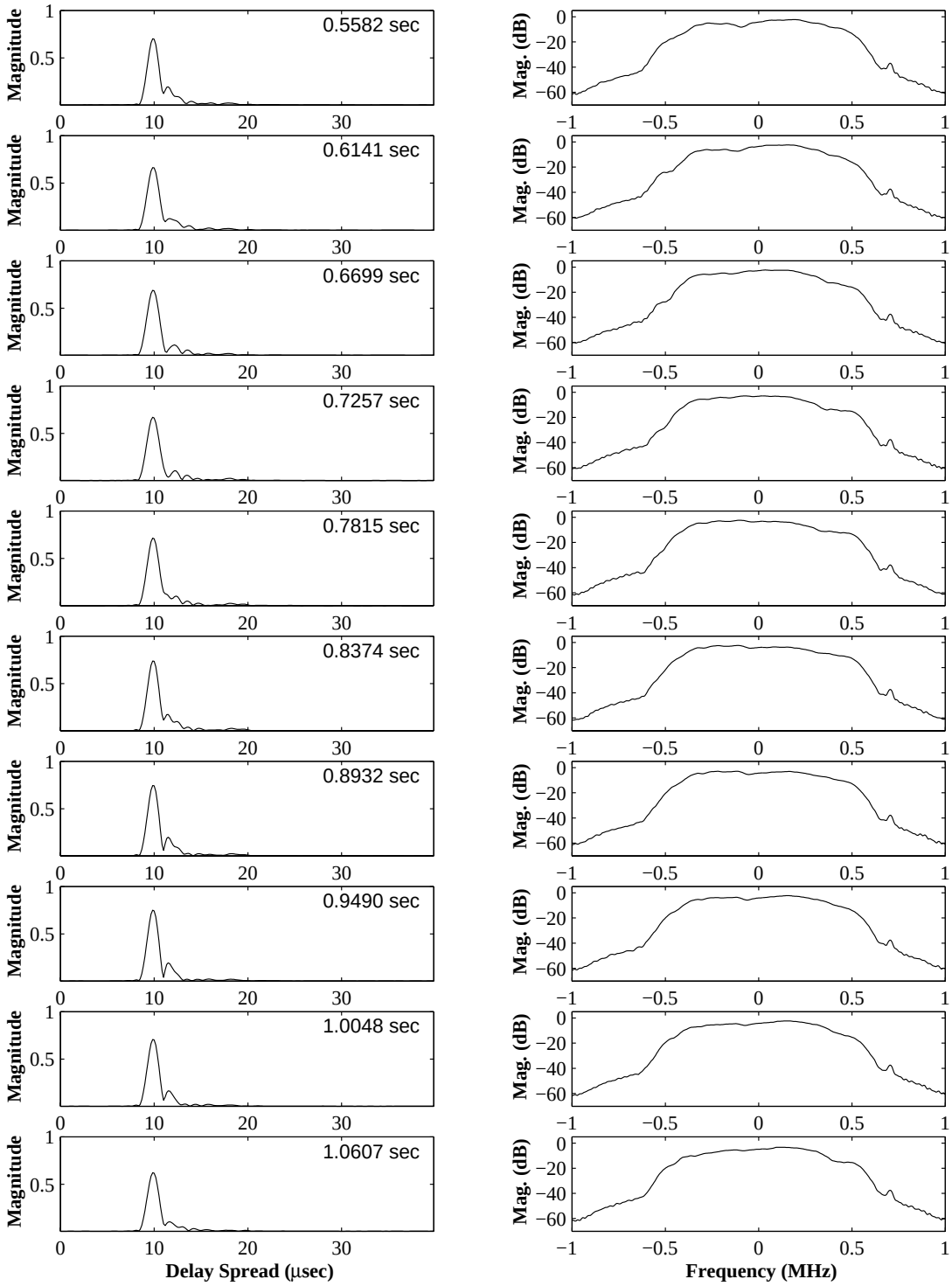

Figure 2.118: Local power delay profiles for hmmwv1340 (2).

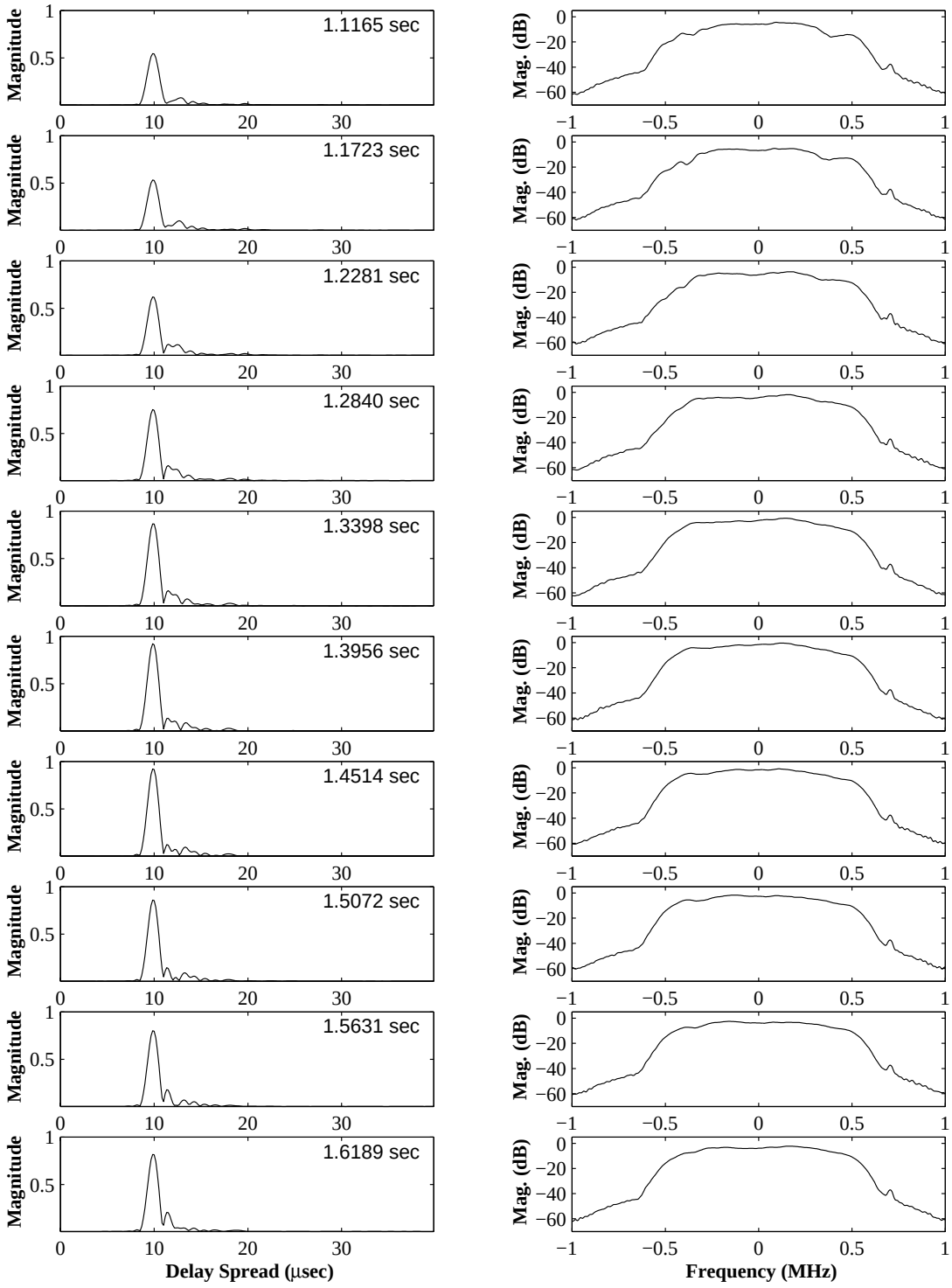

Figure 2.119: Local power delay profiles for hmmwv1340 (3).

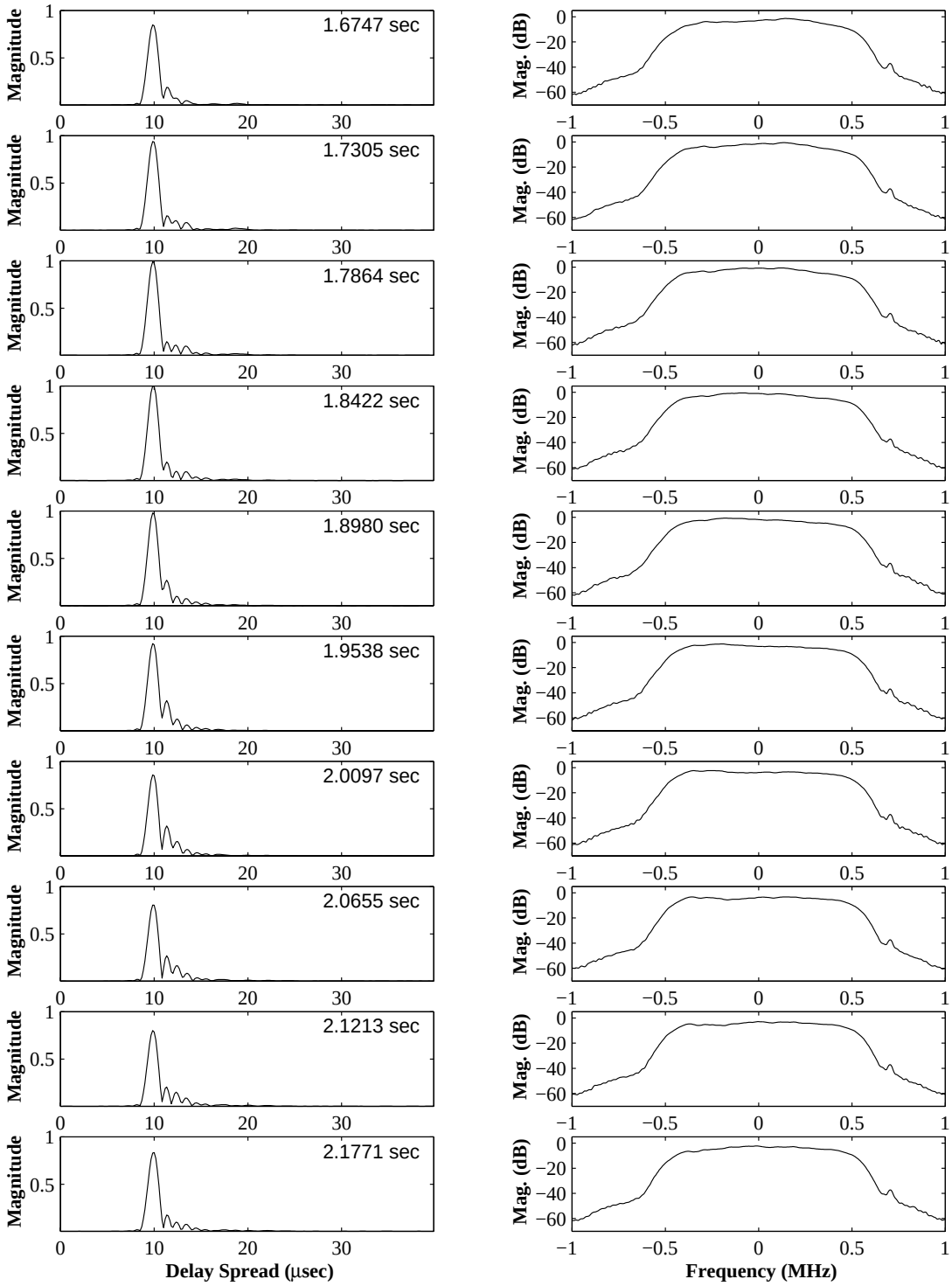

Figure 2.120: Local power delay profiles for hmmwv1340 (4).

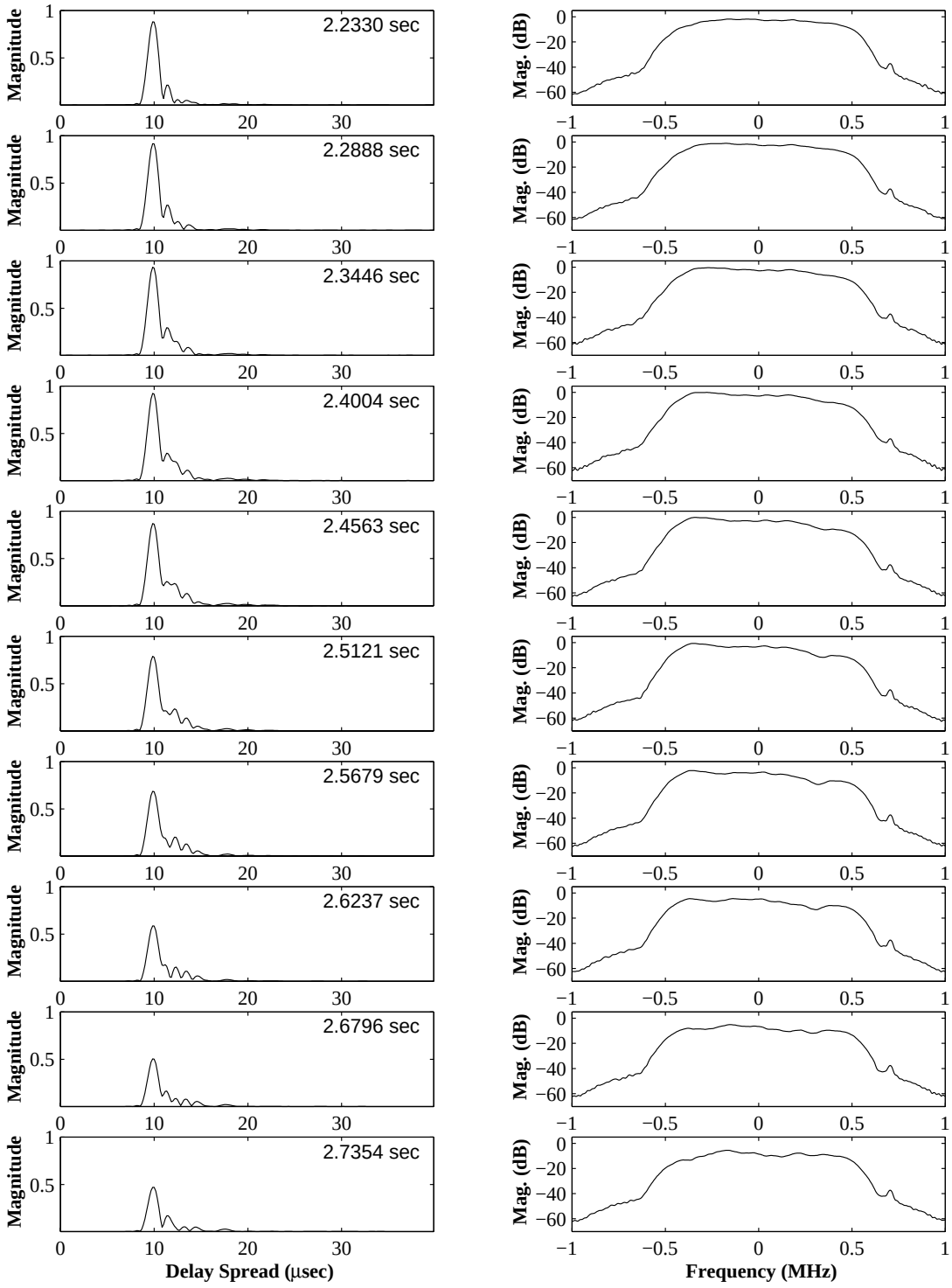

Figure 2.121: Local power delay profiles for hmmwv1340 (5).

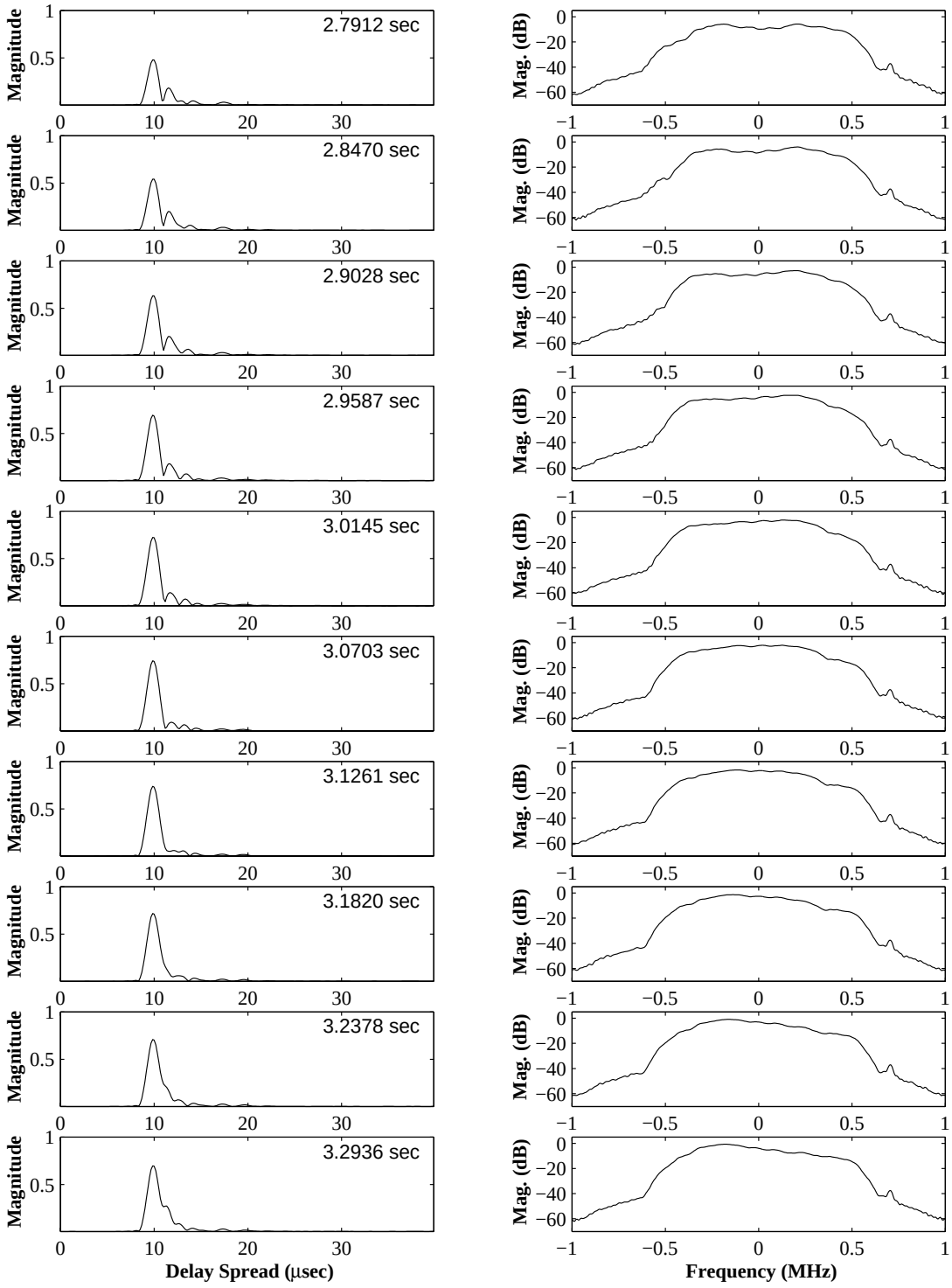

Figure 2.122: Local power delay profiles for hmmwv1340 (6).

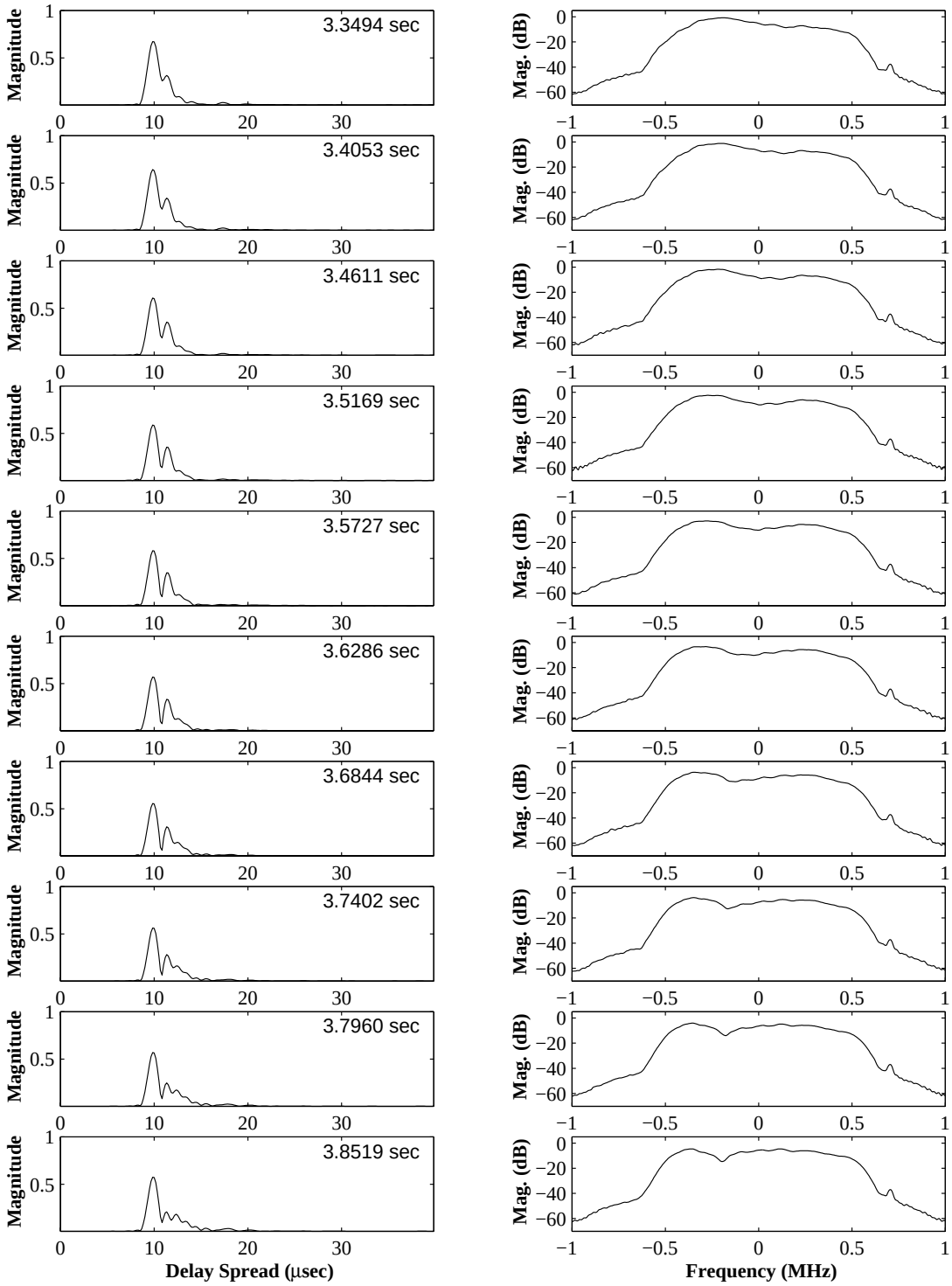

Figure 2.123: Local power delay profiles for hmmwv1340 (7).

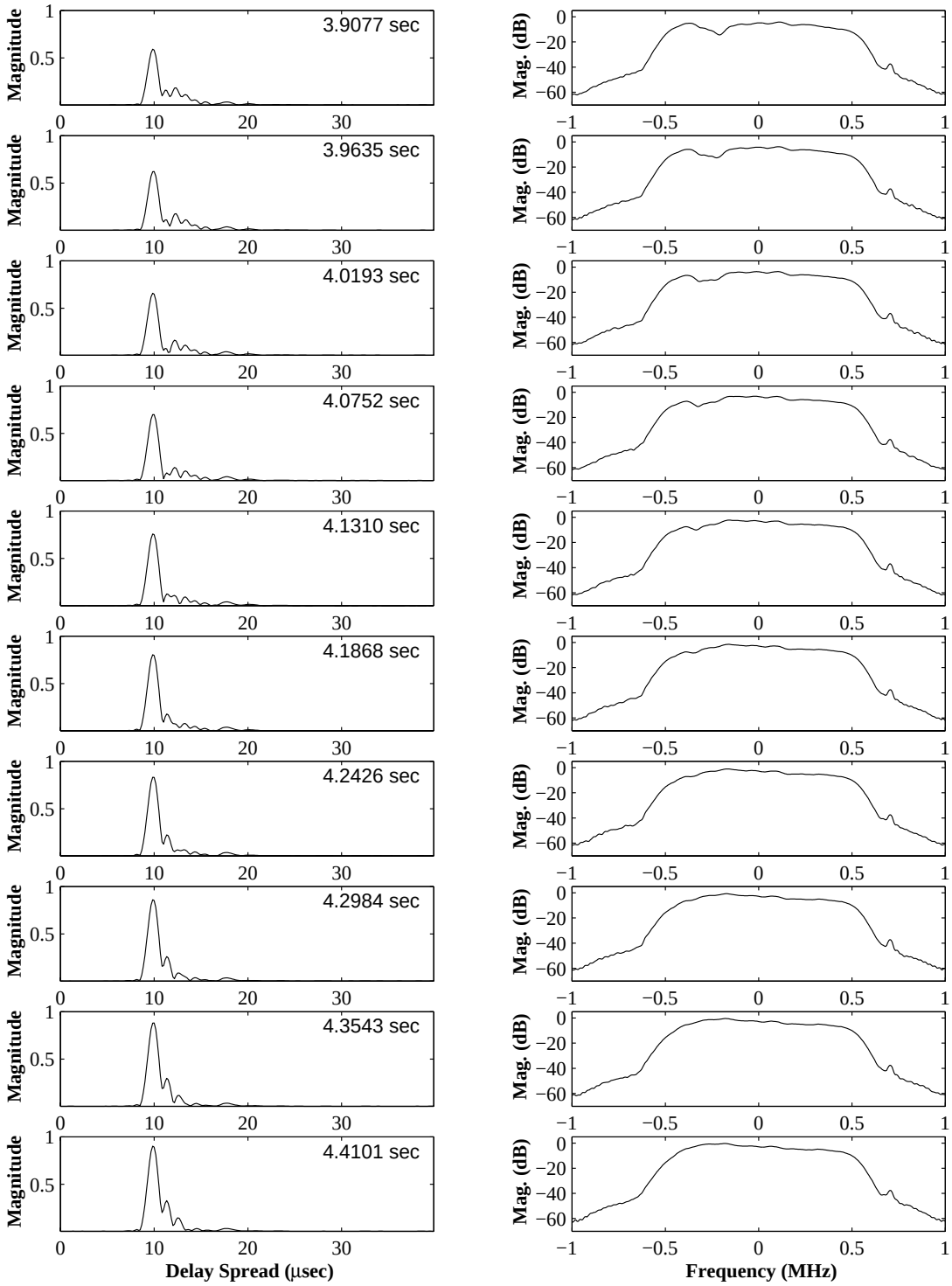

Figure 2.124: Local power delay profiles for hmmwv1340 (8).

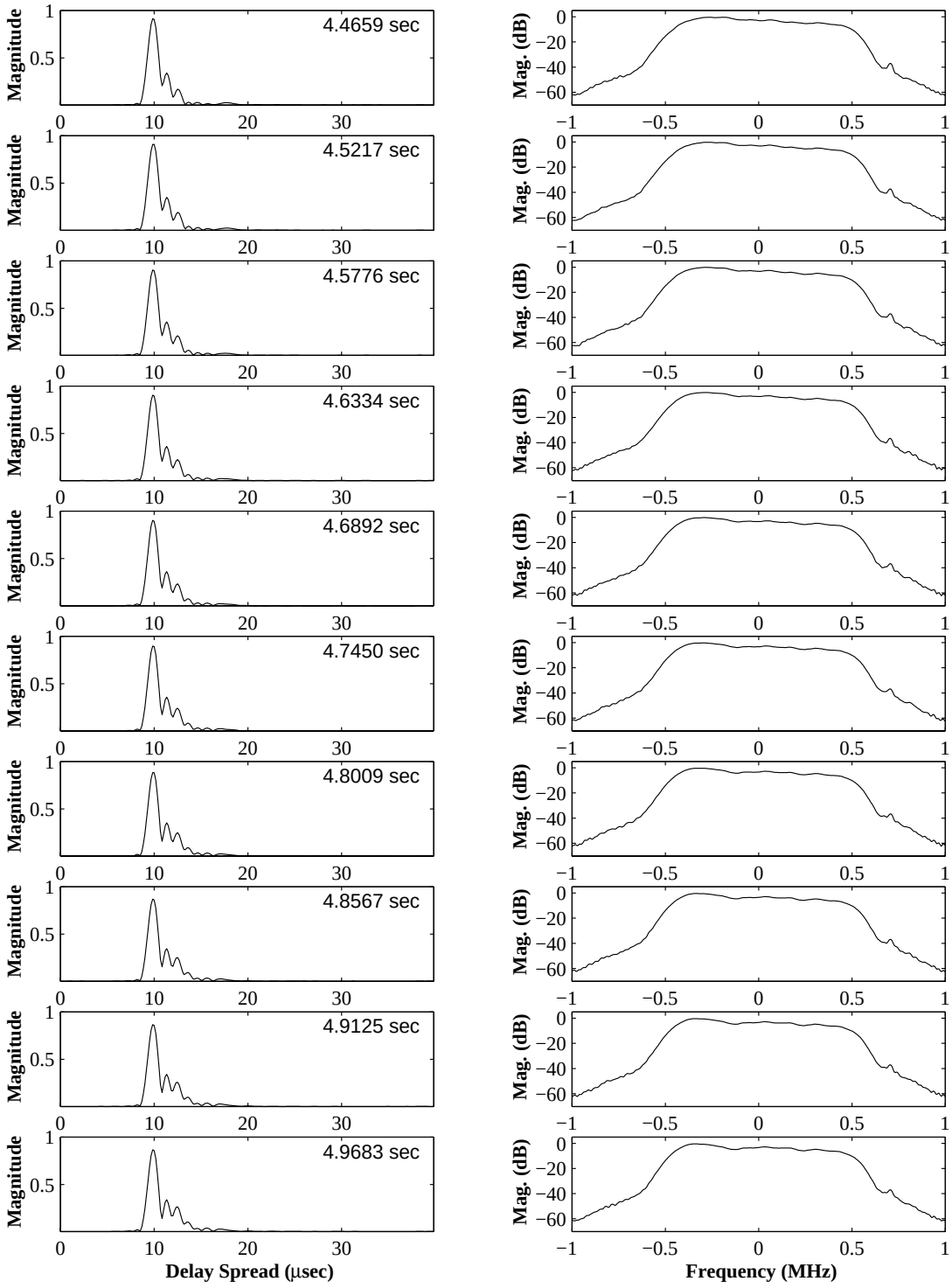

Figure 2.125: Local power delay profiles for hmmwv1340 (9).

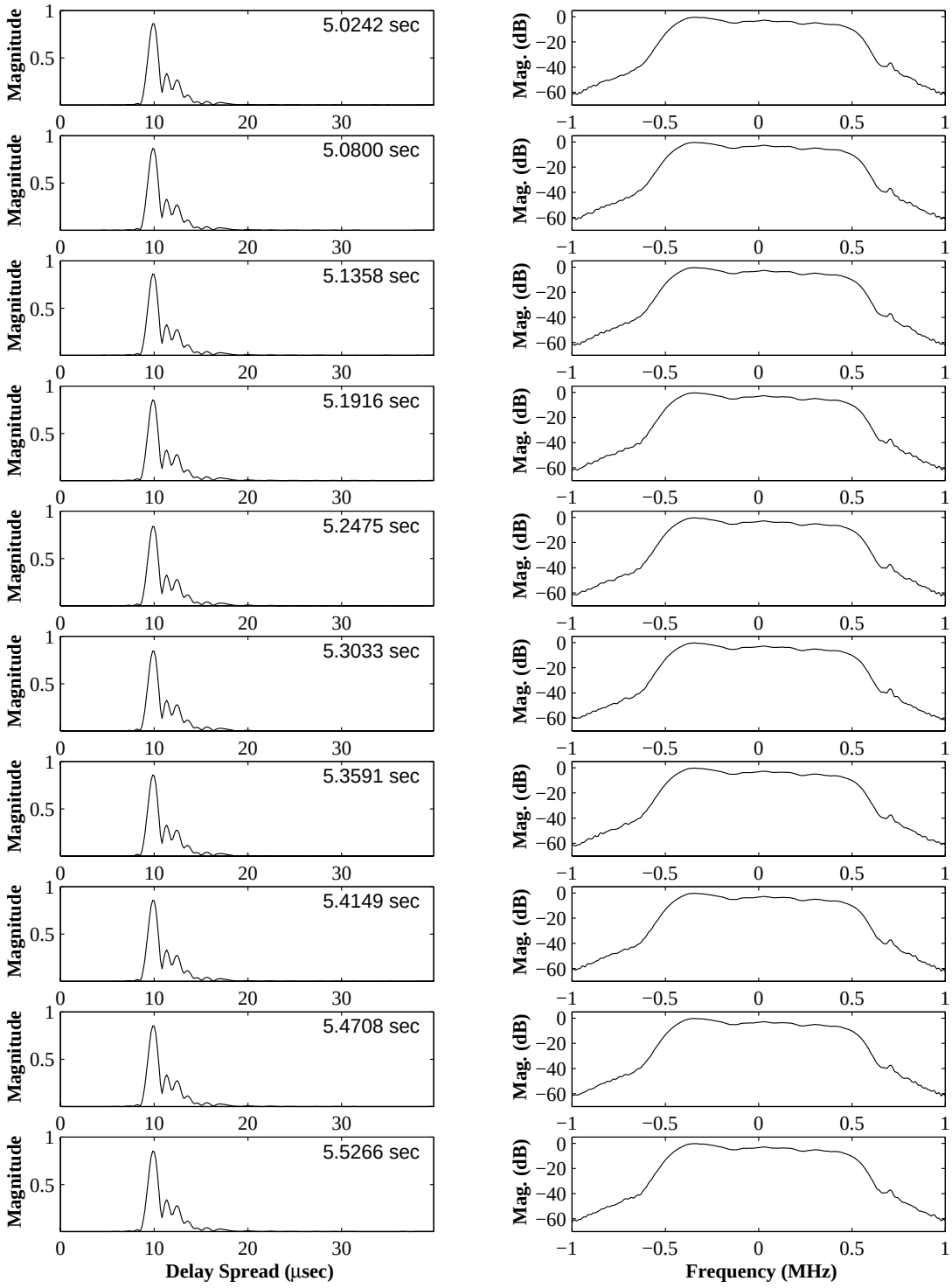

Figure 2.126: Local power delay profiles for hmmwv1340 (10).

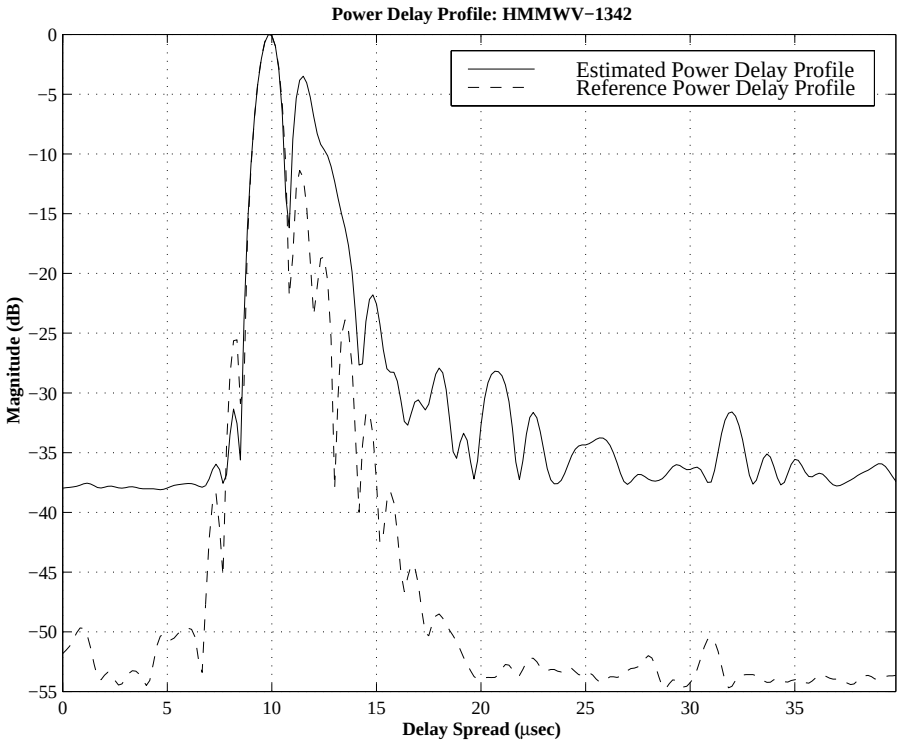

Figure 2.127: Power delay profile for hmmwv1342.

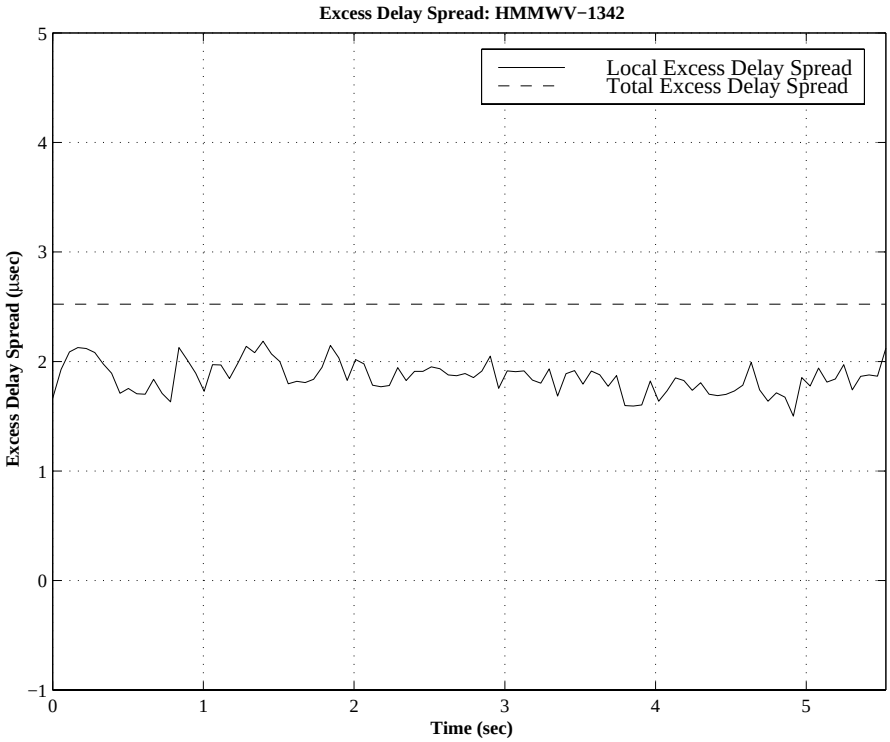

Figure 2.128: Excess delay spread for hmmwv1342.

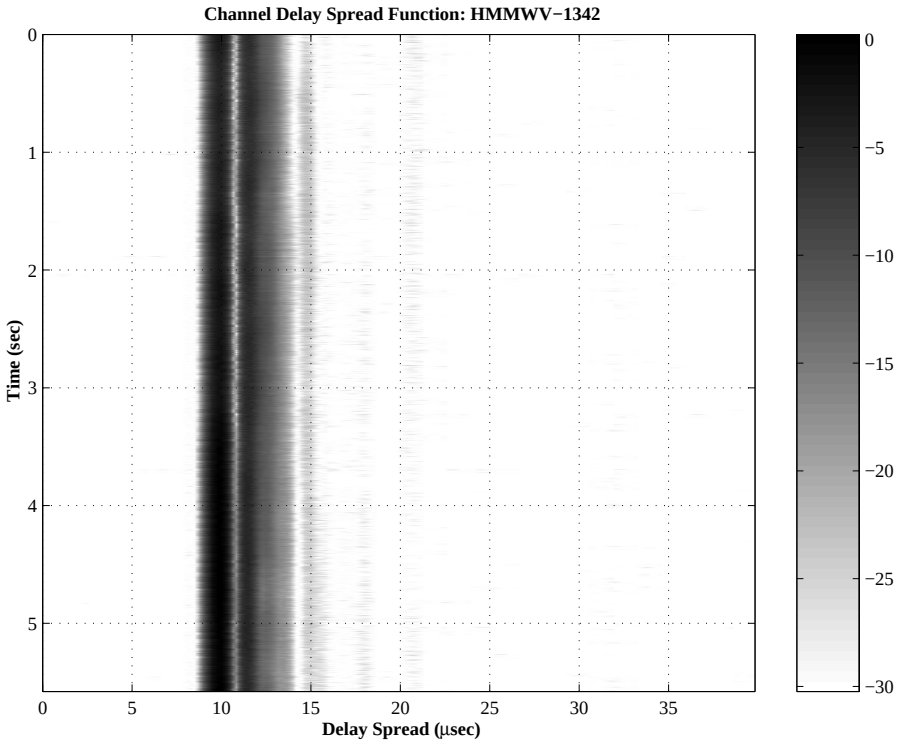

Figure 2.129: Channel delay spread function for hmmwv1342.

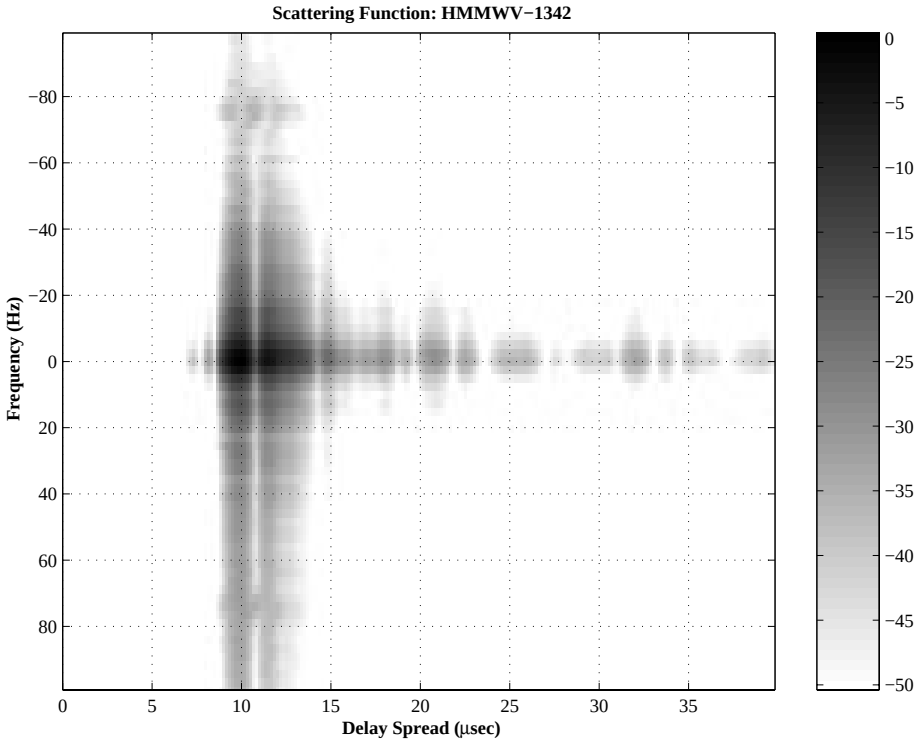

Figure 2.130: Scattering function for hmmwv1342.

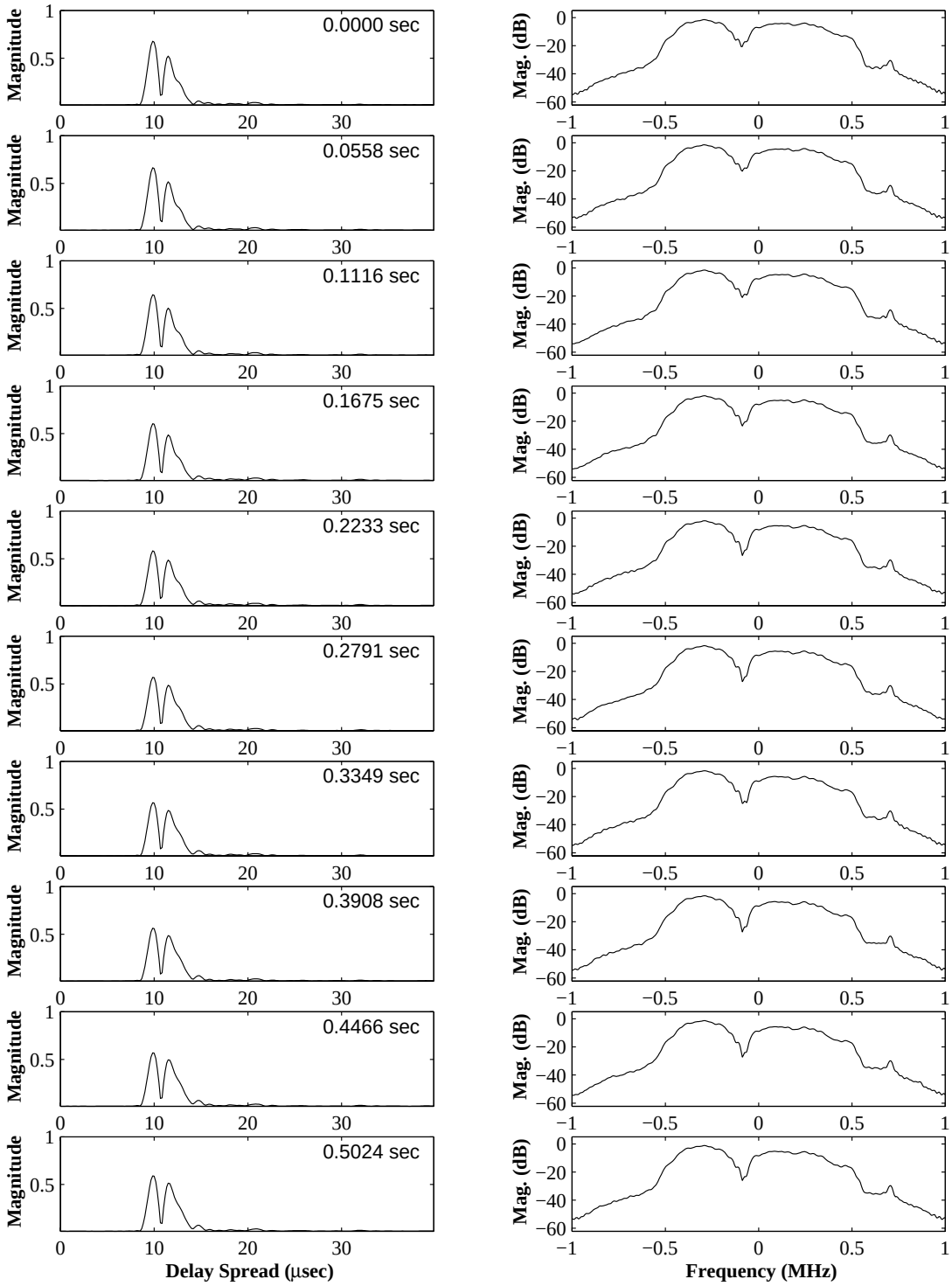

Figure 2.131: Local power delay profiles for hmmwv1342 (1).

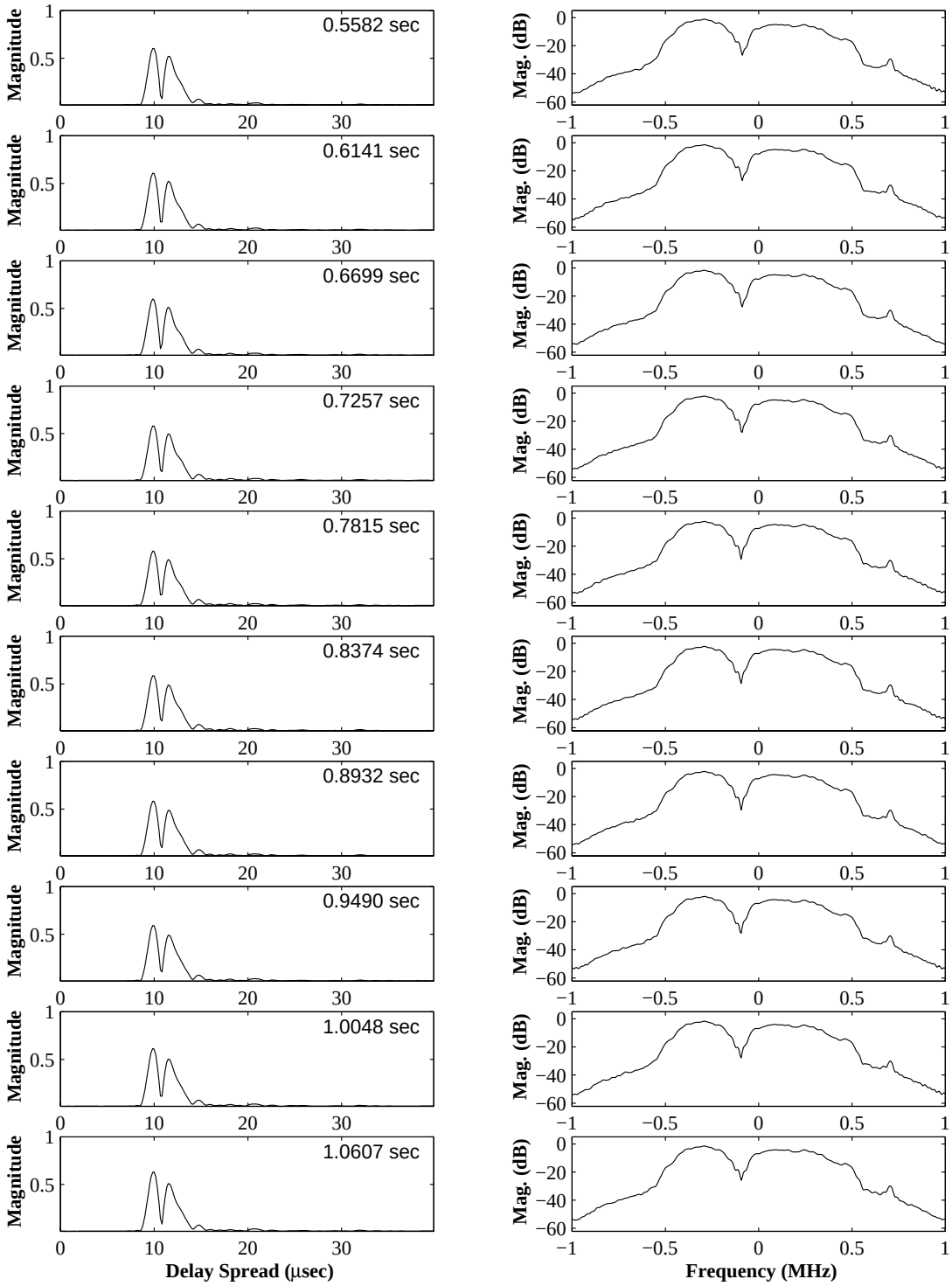

Figure 2.132: Local power delay profiles for hmmwv1342 (2).

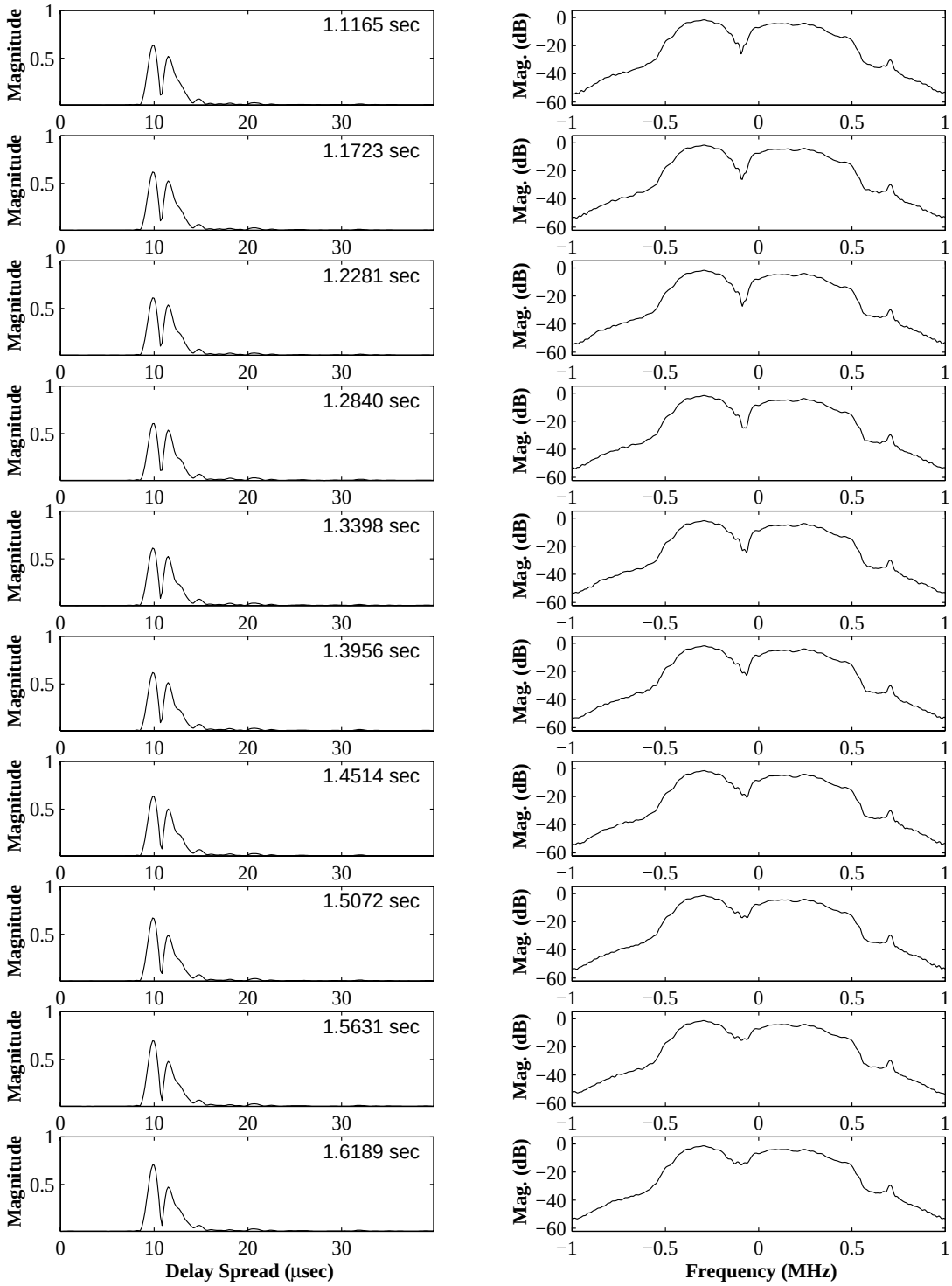

Figure 2.133: Local power delay profiles for hmmwv1342 (3).

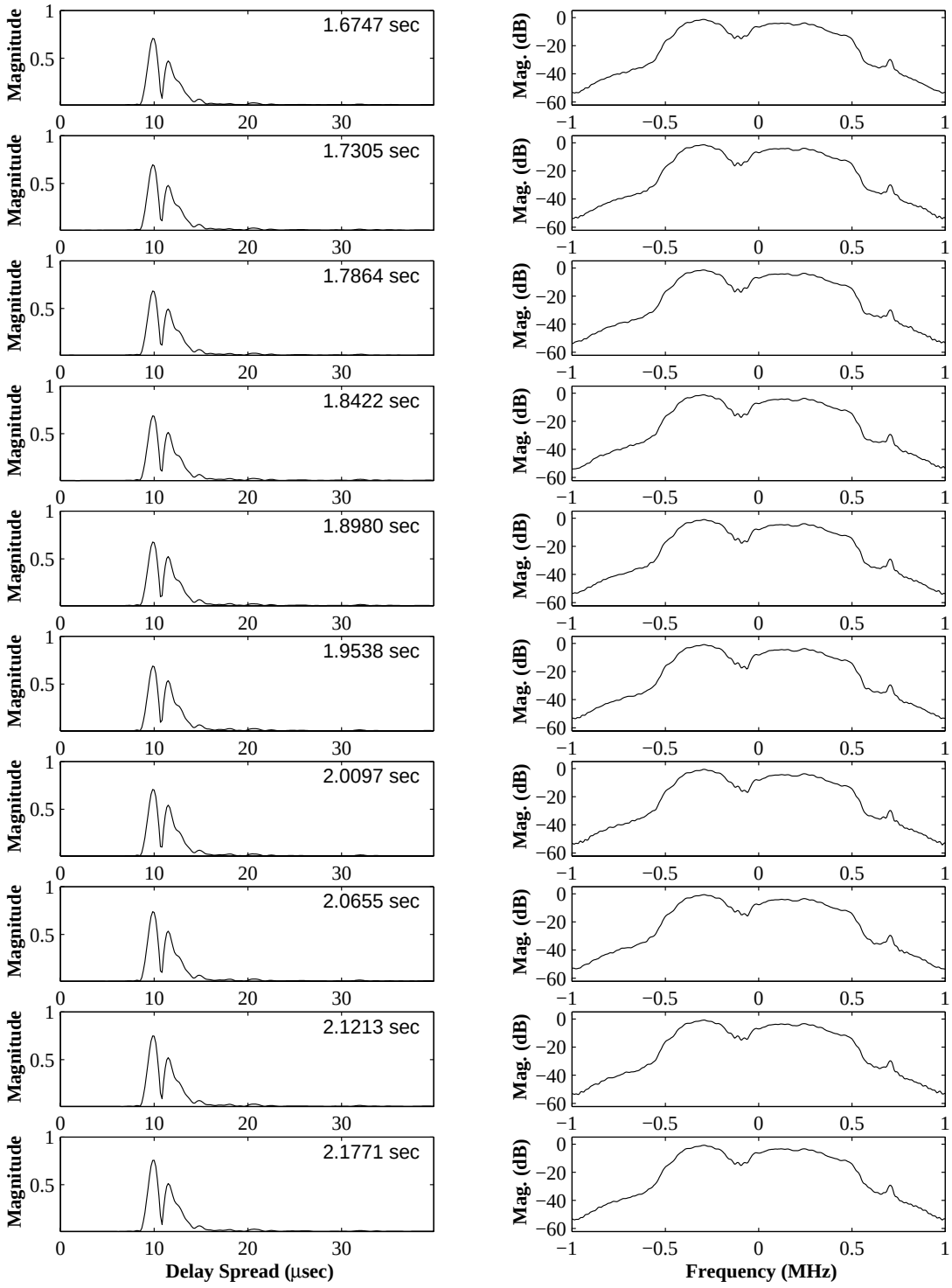

Figure 2.134: Local power delay profiles for hmmwv1342 (4).

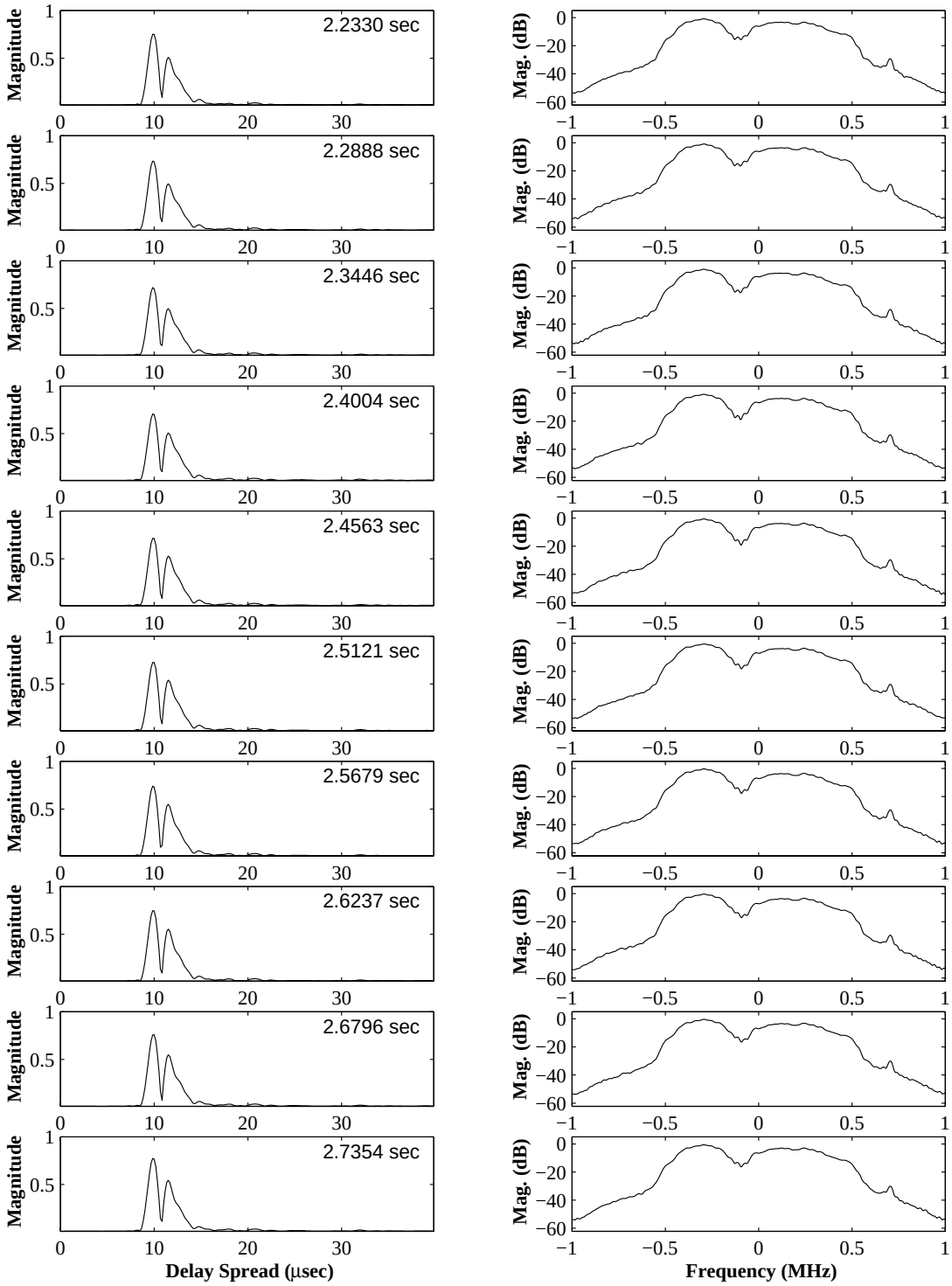

Figure 2.135: Local power delay profiles for hmmwv1342 (5).

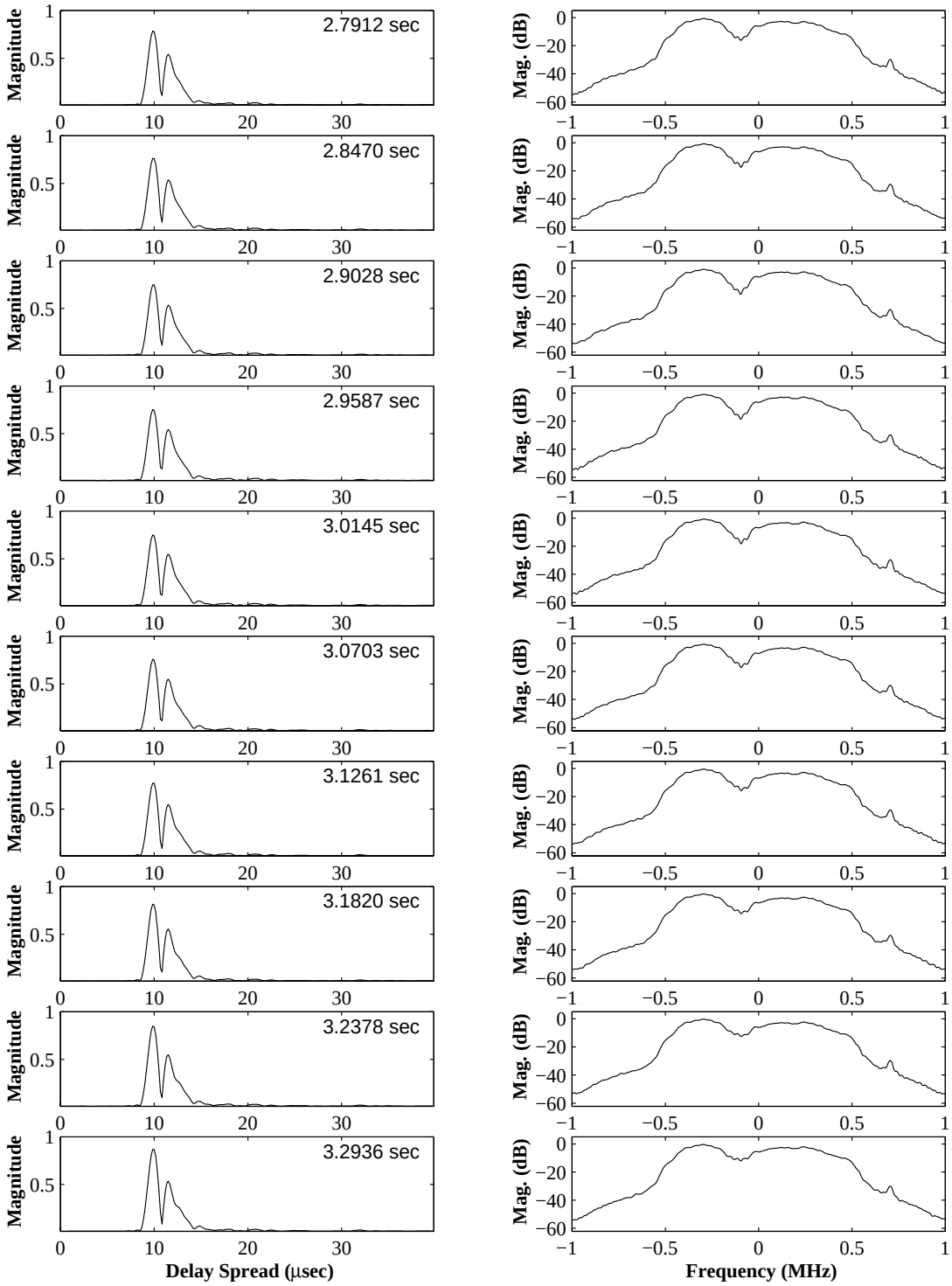

Figure 2.136: Local power delay profiles for hmmwv1342 (6).

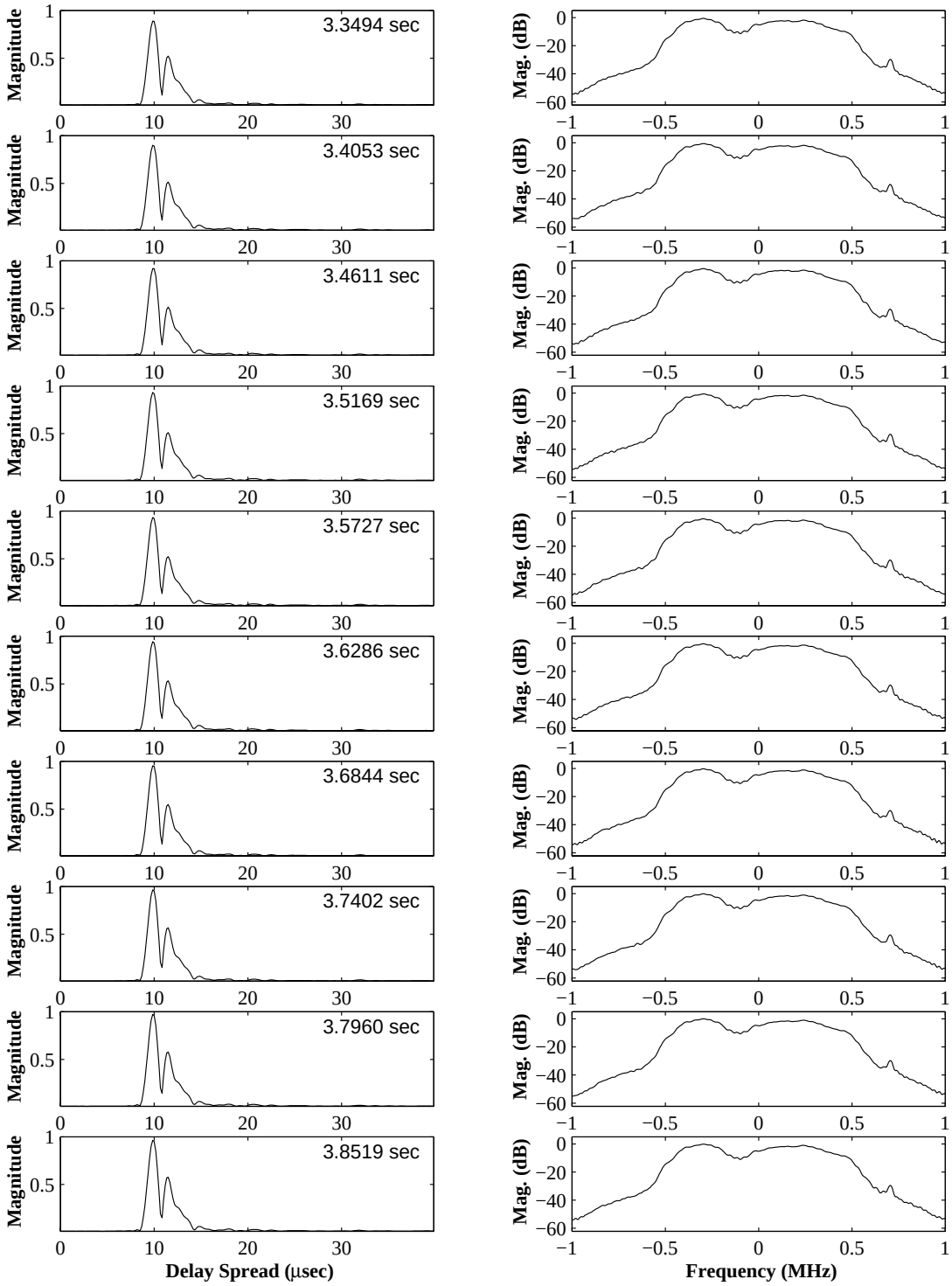

Figure 2.137: Local power delay profiles for hmmwv1342 (7).

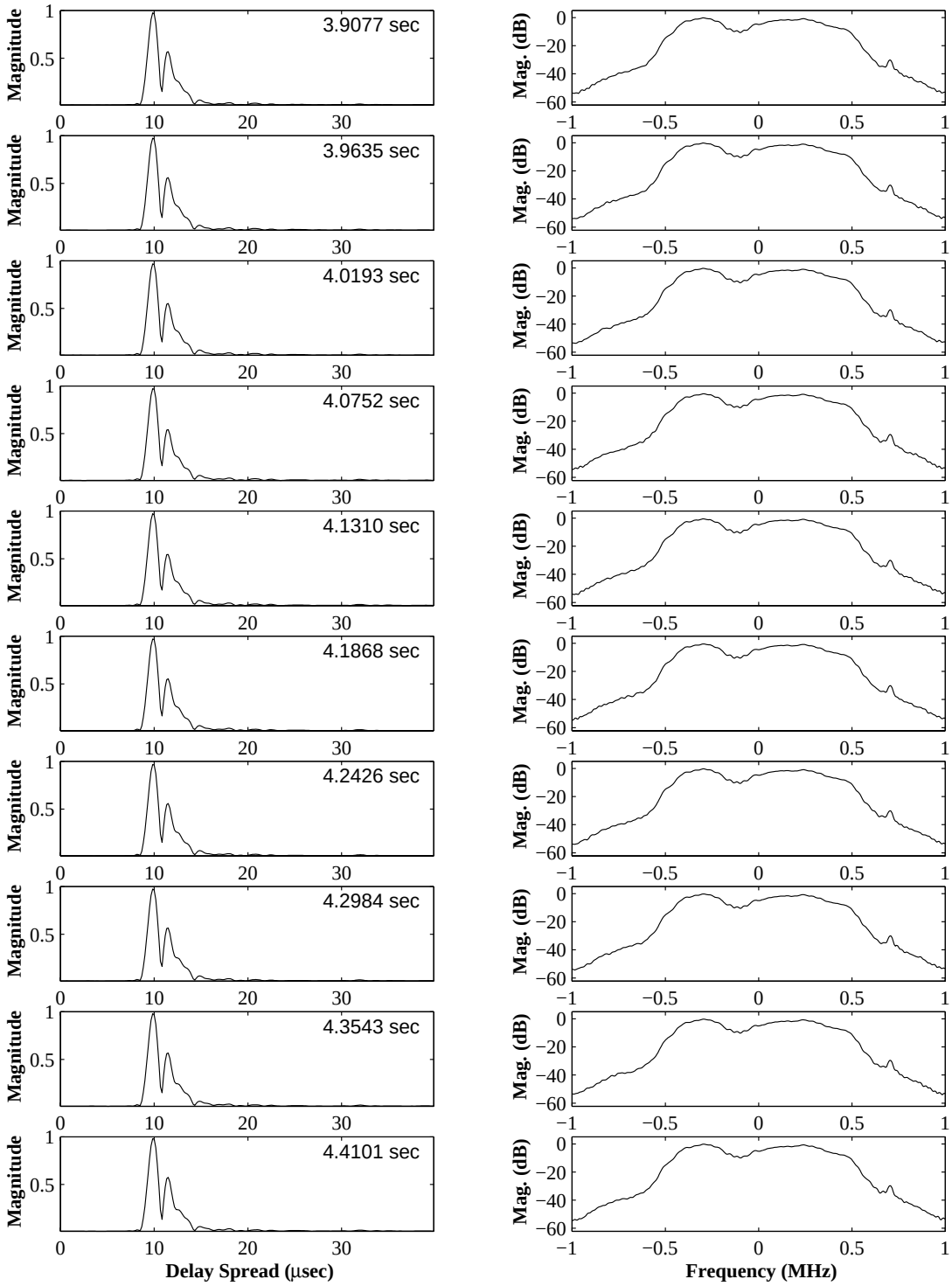

Figure 2.138: Local power delay profiles for hmmwv1342 (8).

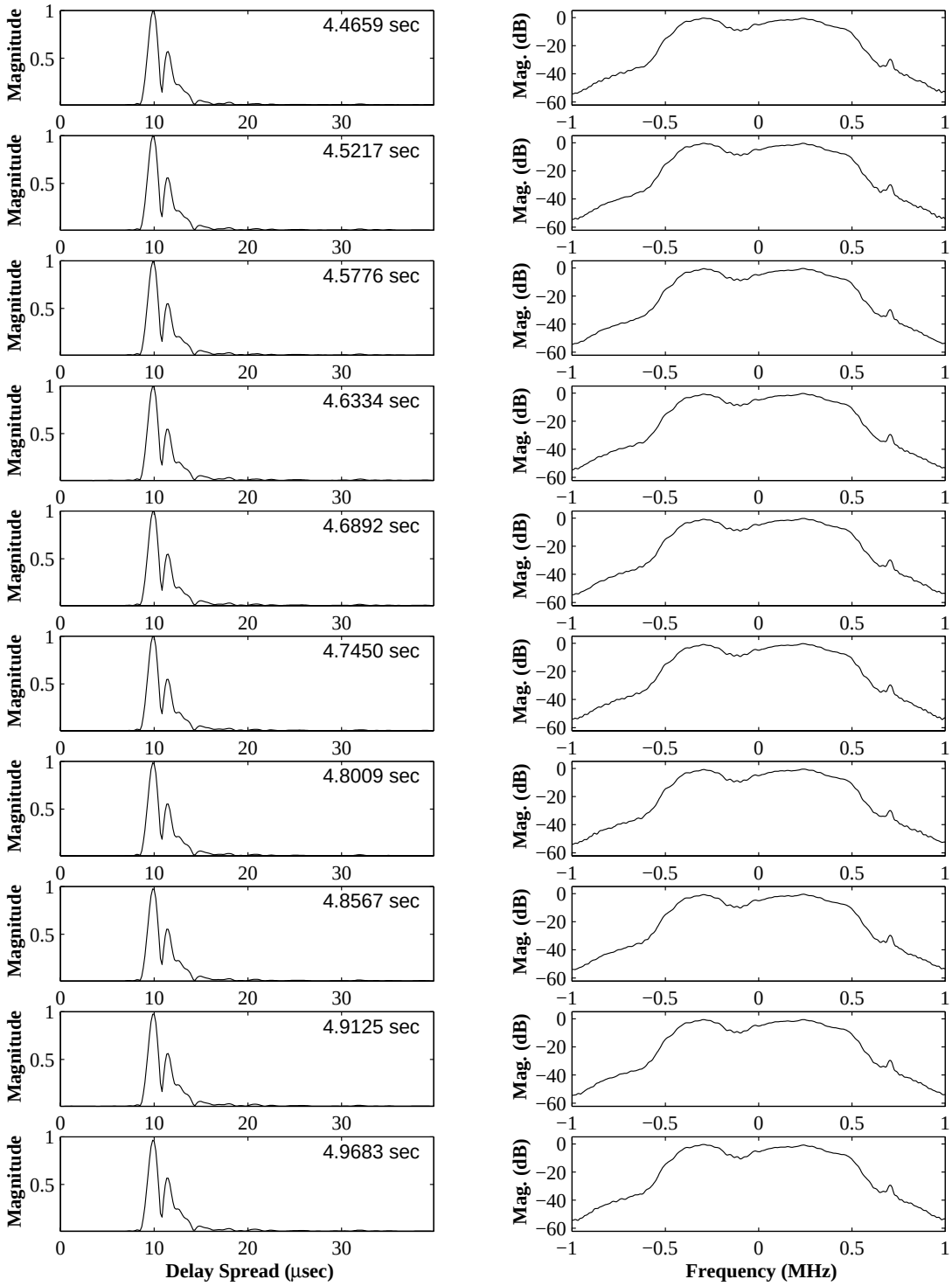

Figure 2.139: Local power delay profiles for hmmwv1342 (9).

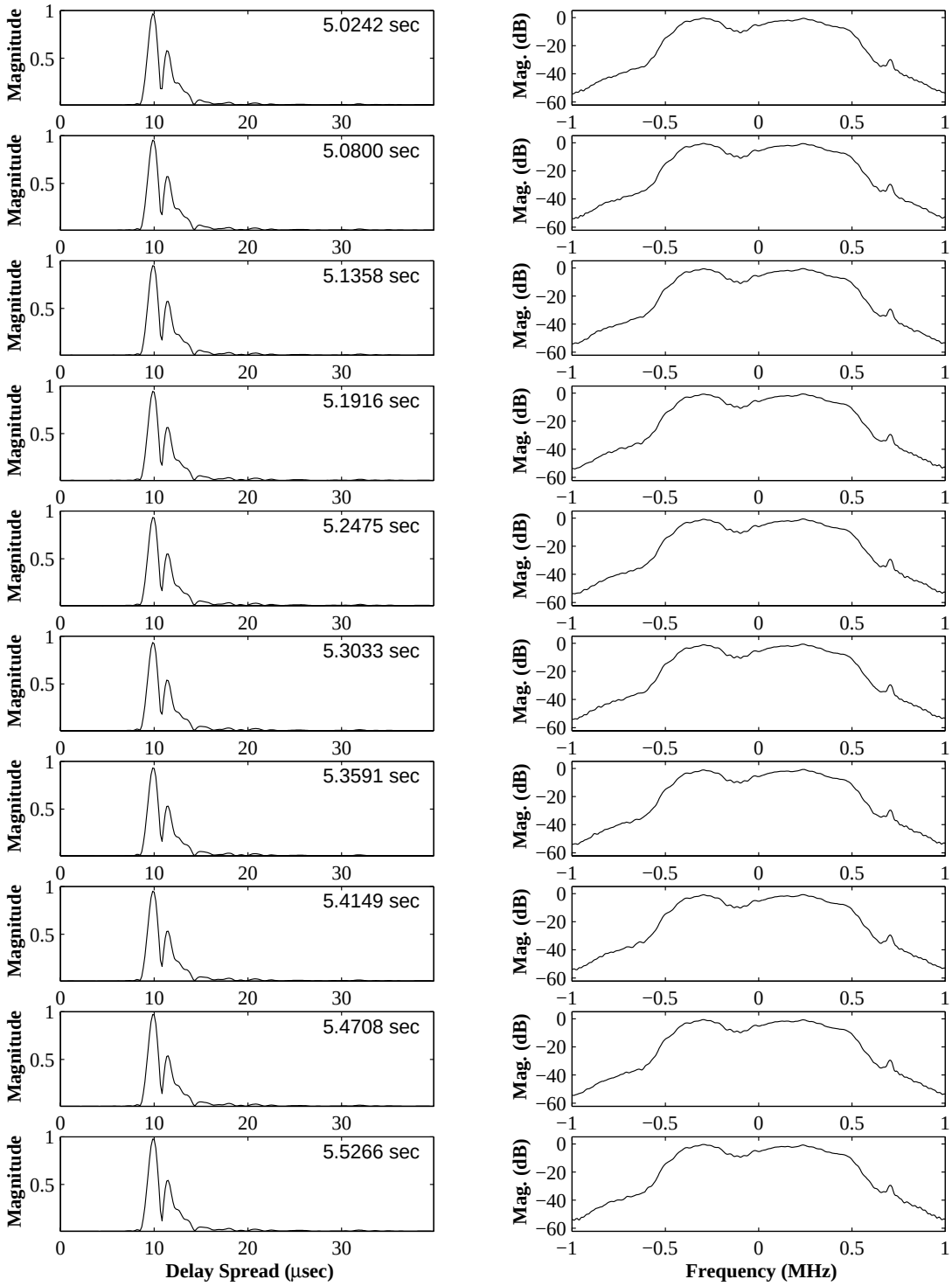

Figure 2.140: Local power delay profiles for hmmwv1342 (10).

Chapter 3

Ship-to-Shore Data: Jan. 21-22

The following table lists the ship-to-shore experimental data sets and the corresponding pages of the processing results:

Data Set	Pages
ship21jan0843.snp:	124 - 135
ship21jan1459.snp:	136 - 147
ship21jan1518.snp:	148 - 159
ship21jan1607.snp:	160 - 171
ship21jan1642.snp:	172 - 183
ship21jan1739.snp:	184 - 195
ship21jan1824.snp:	196 - 207
ship21jan1936.snp:	208 - 219
ship21jan1958.snp:[1]	220 - 231
ship22jan1117.snp:	232 - 243
ship22jan1507.snp:	244 - 255
ship22jan1526.snp:[1]	256 - 267
ship22jan1757.snp:	268 - 279
ship22jan1800.snp:	280 - 291

[1] Low Rx SNR. Noise has corrupted AF results.

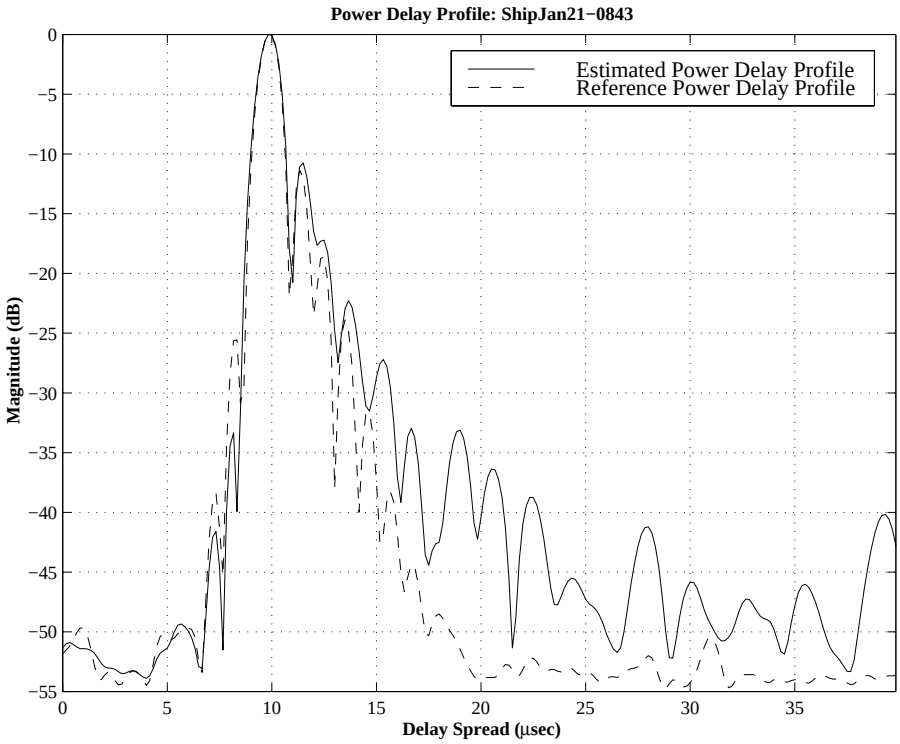

Figure 3.1: Power delay profile for ship21jan0843.

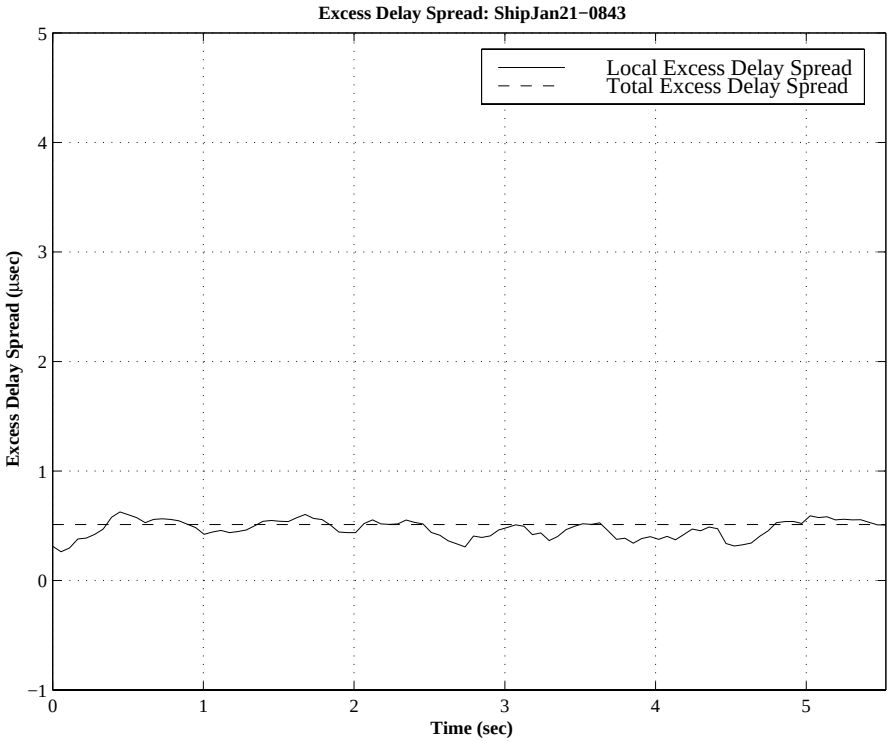

Figure 3.2: Excess delay spread for ship21jan0843.

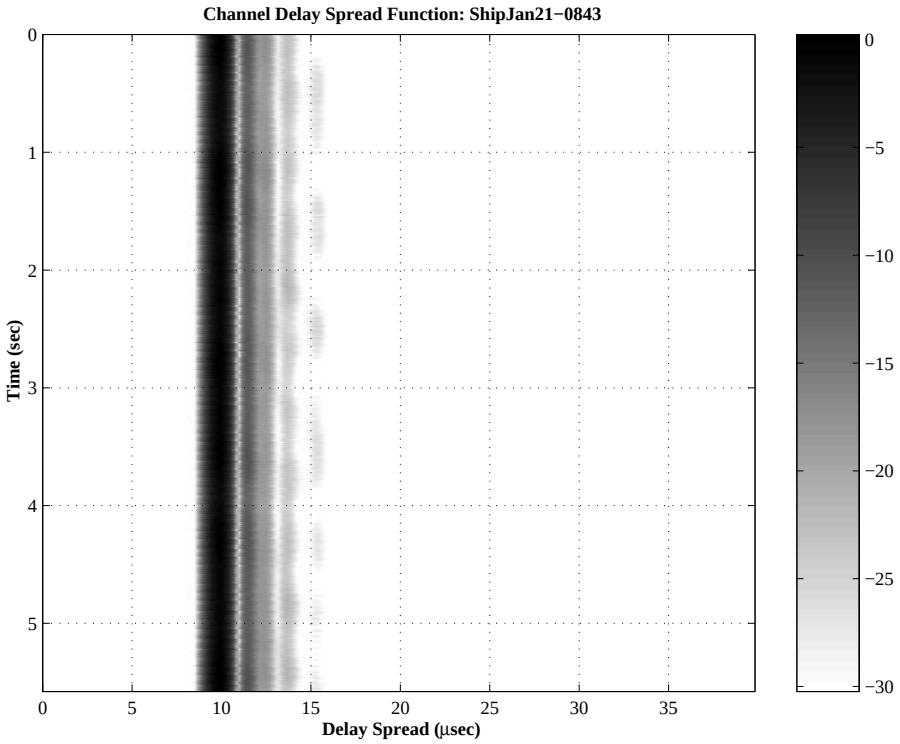

Figure 3.3: Channel delay spread function for ship21jan0843.

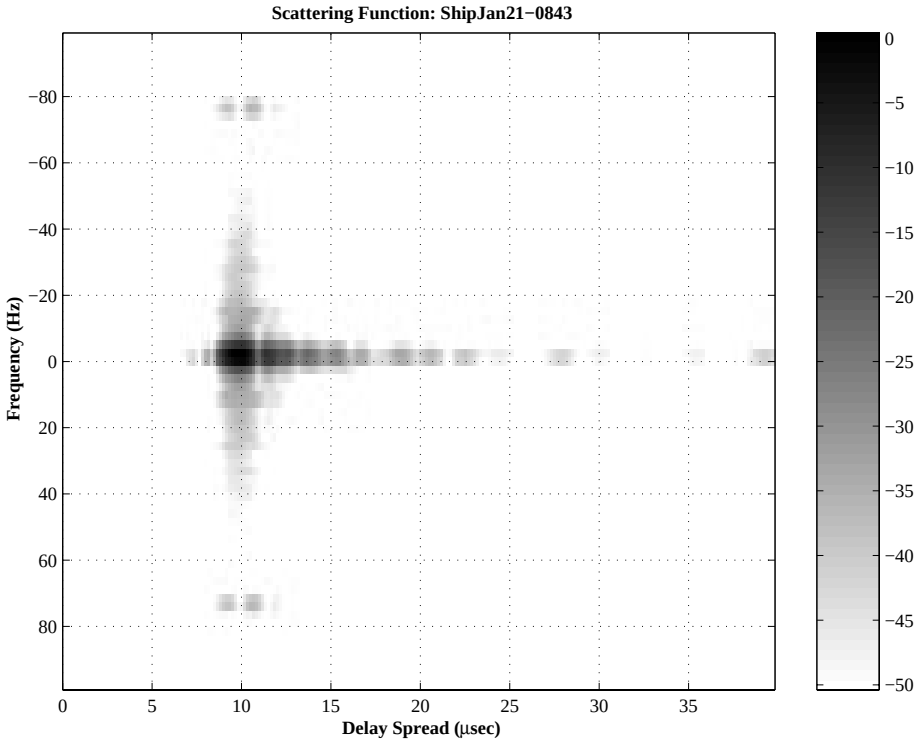

Figure 3.4: Scattering function for ship21jan0843.

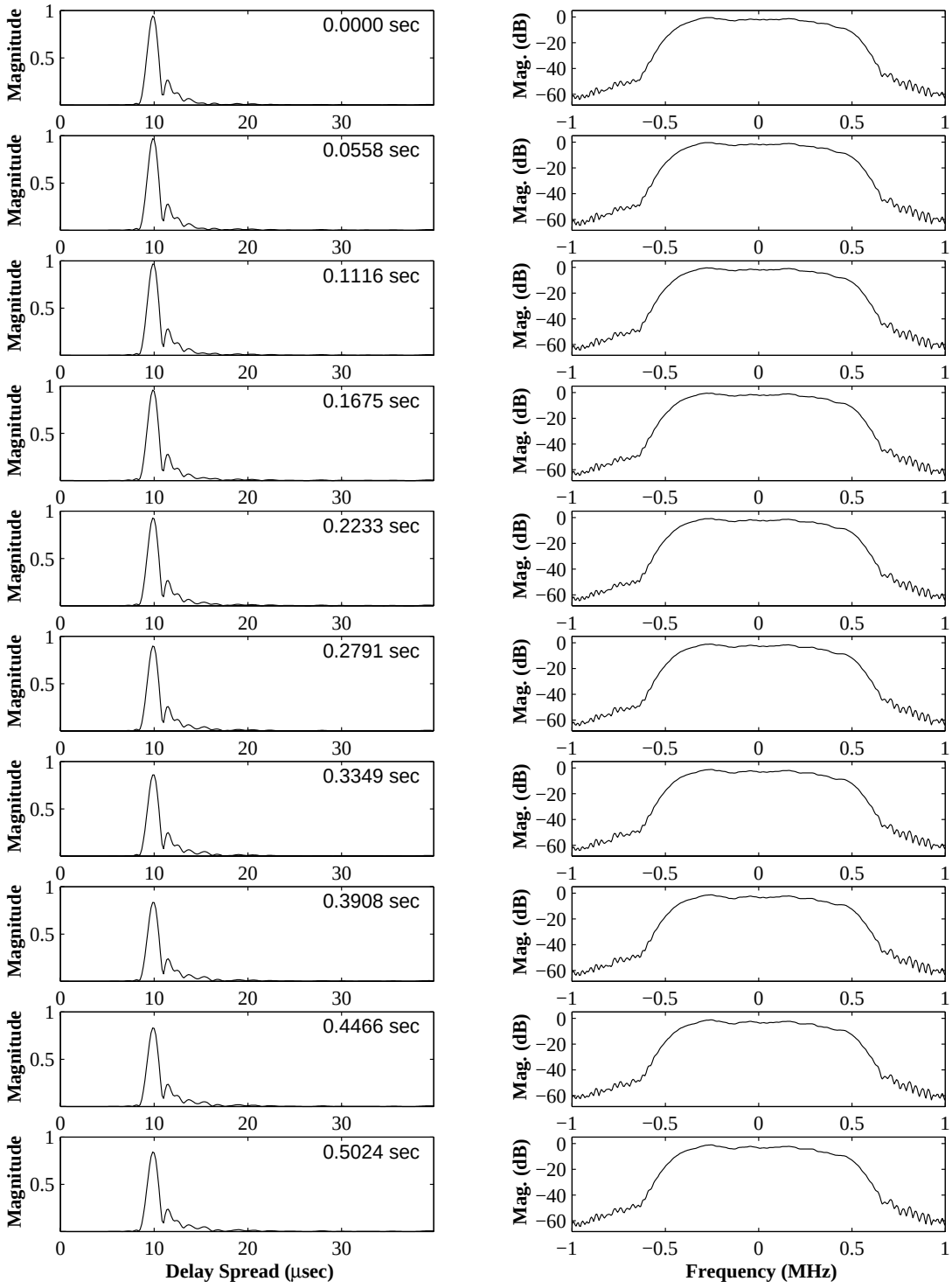

Figure 3.5: Local power delay profiles for ship21jan0843 (1).

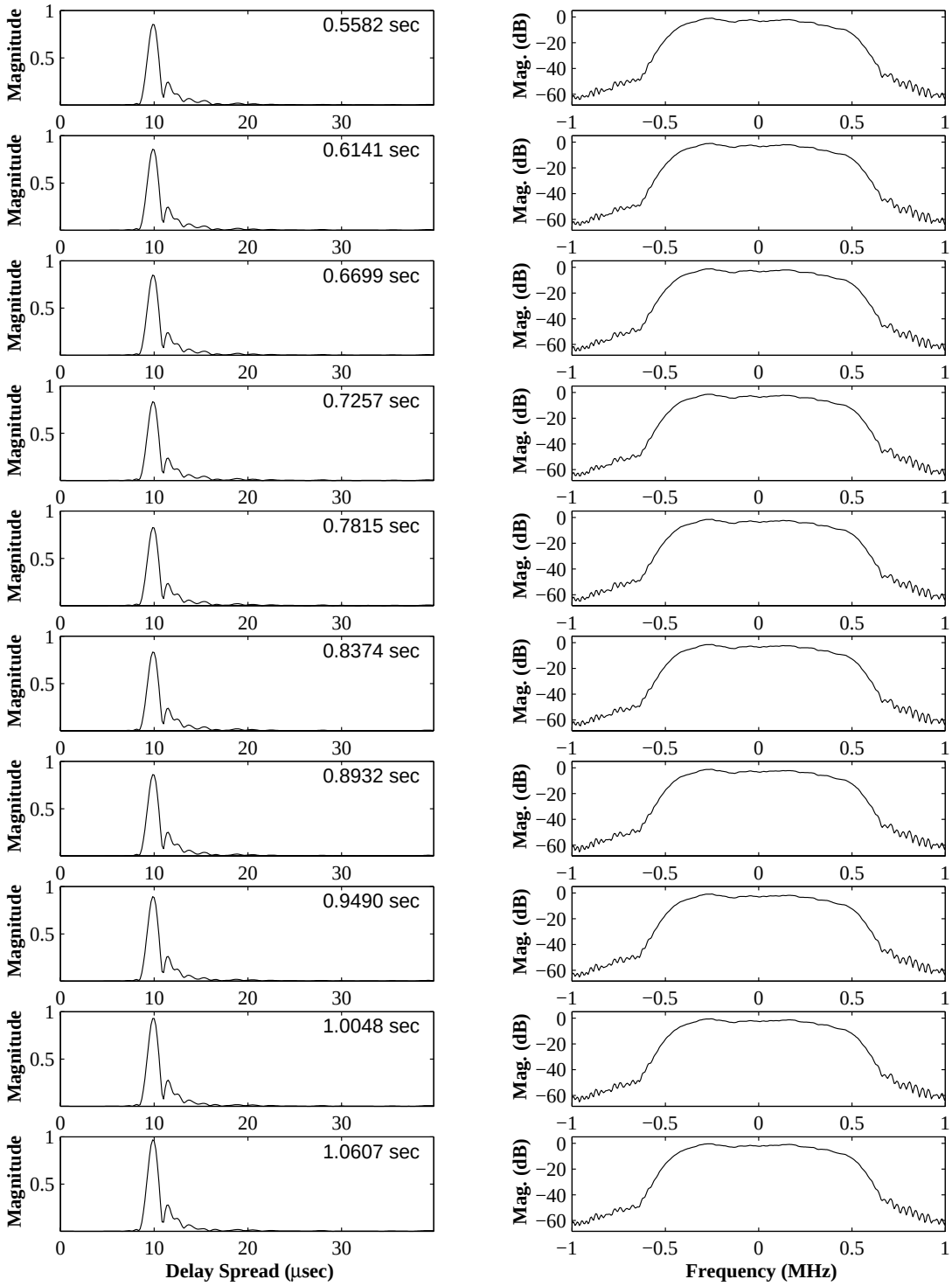

Figure 3.6: Local power delay profiles for ship21jan0843 (2).

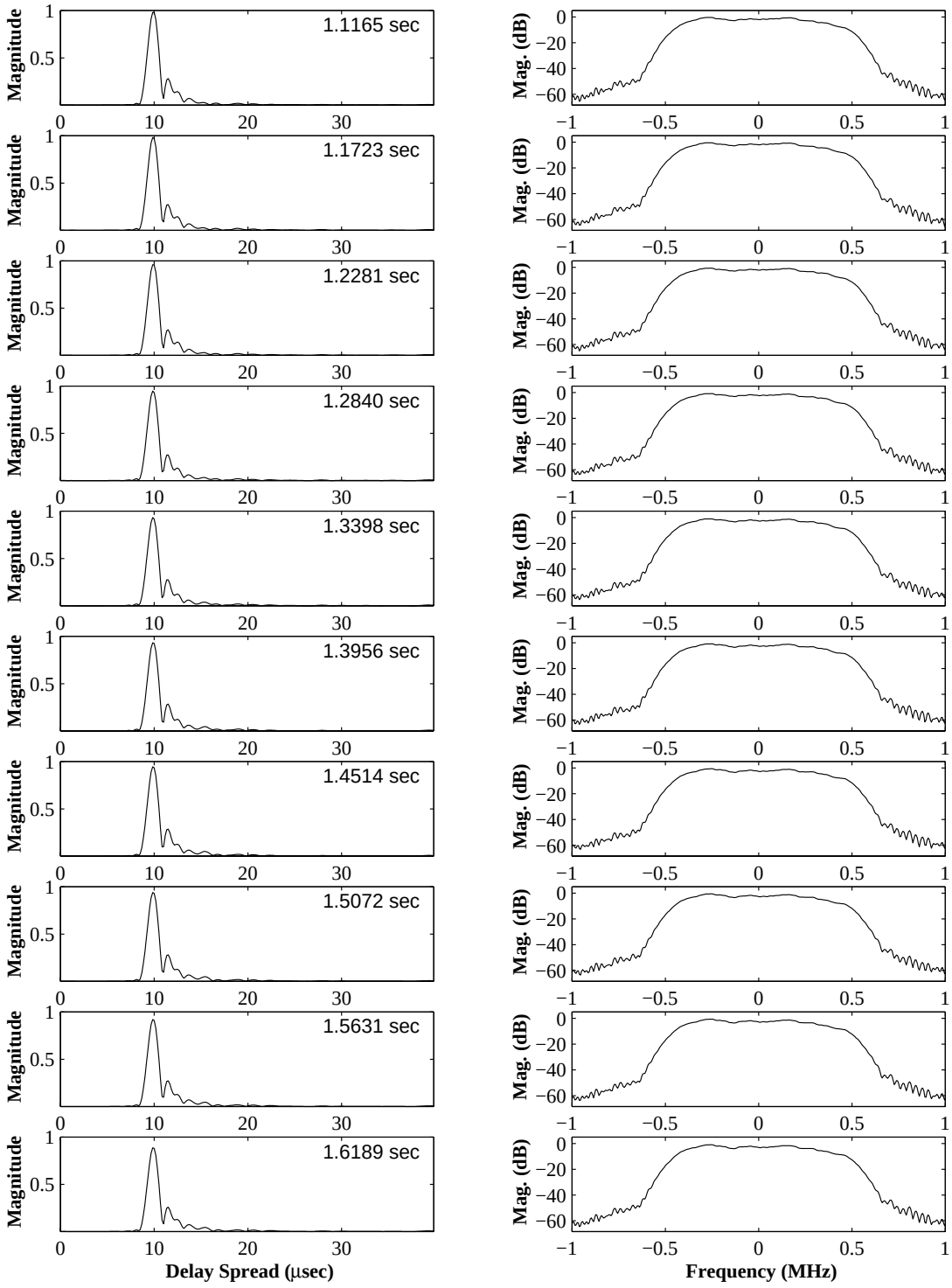

Figure 3.7: Local power delay profiles for ship21jan0843 (3).

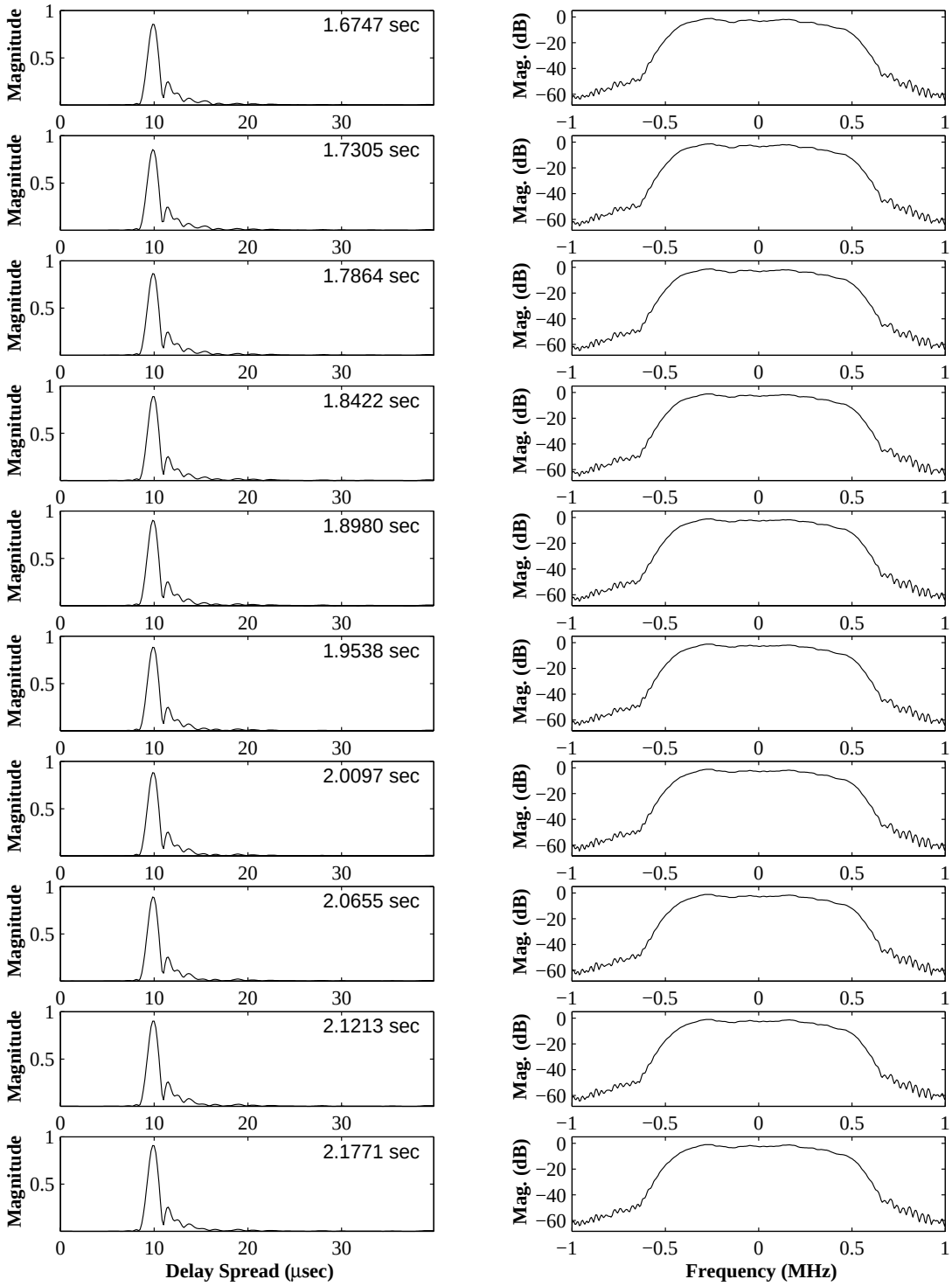

Figure 3.8: Local power delay profiles for ship21jan0843 (4).

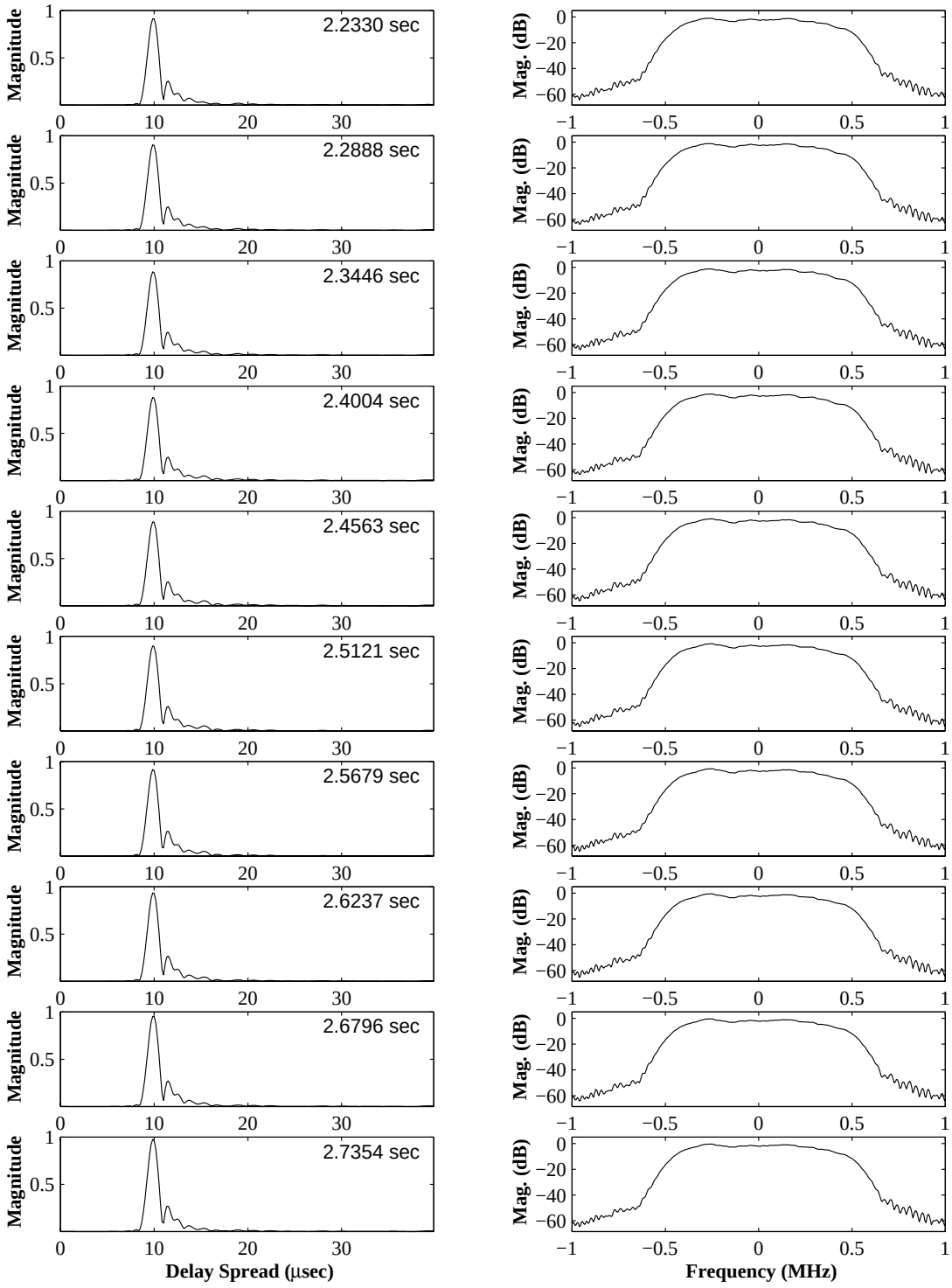

Figure 3.9: Local power delay profiles for ship21jan0843 (5).

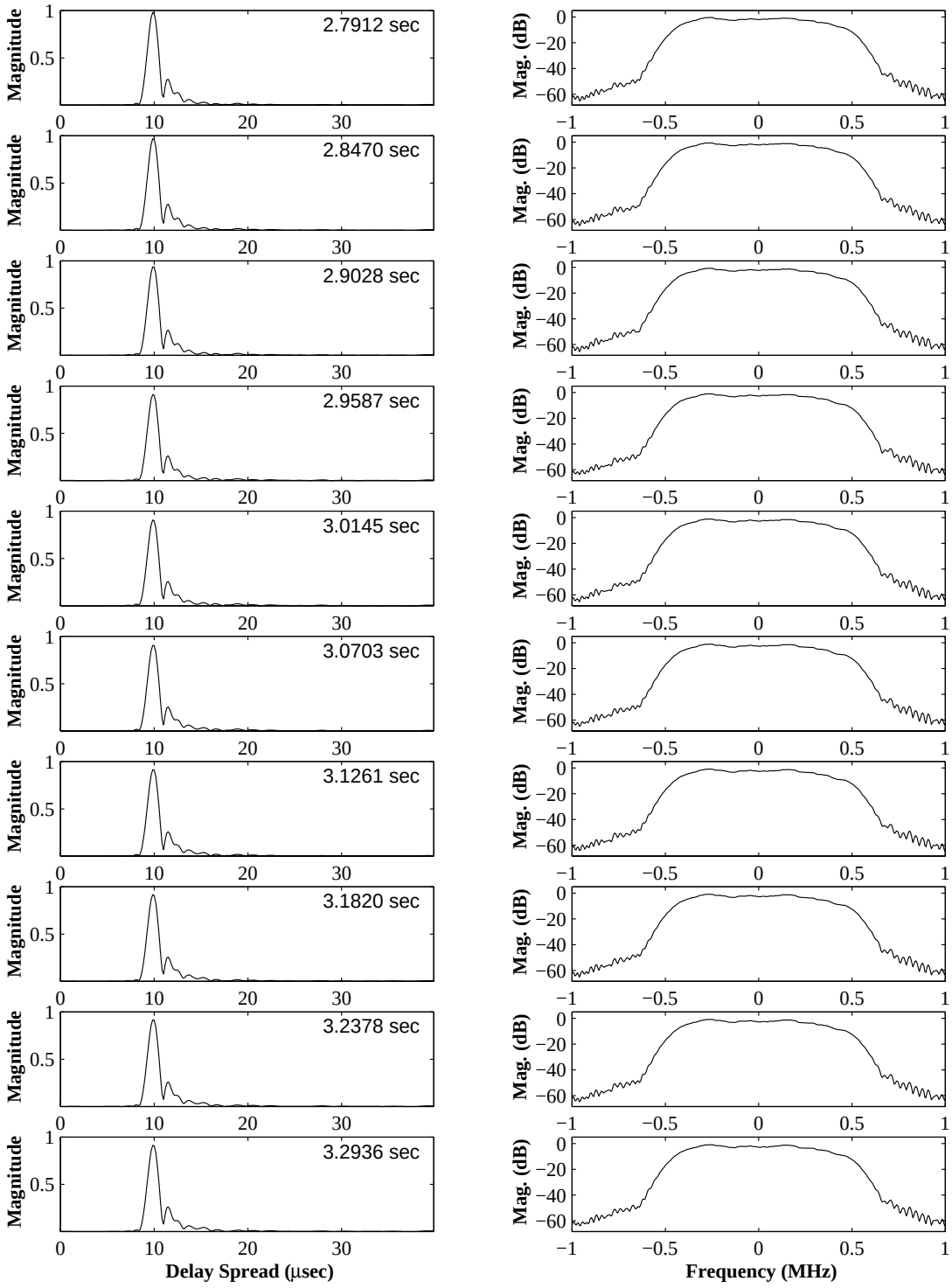

Figure 3.10: Local power delay profiles for ship21jan0843 (6).

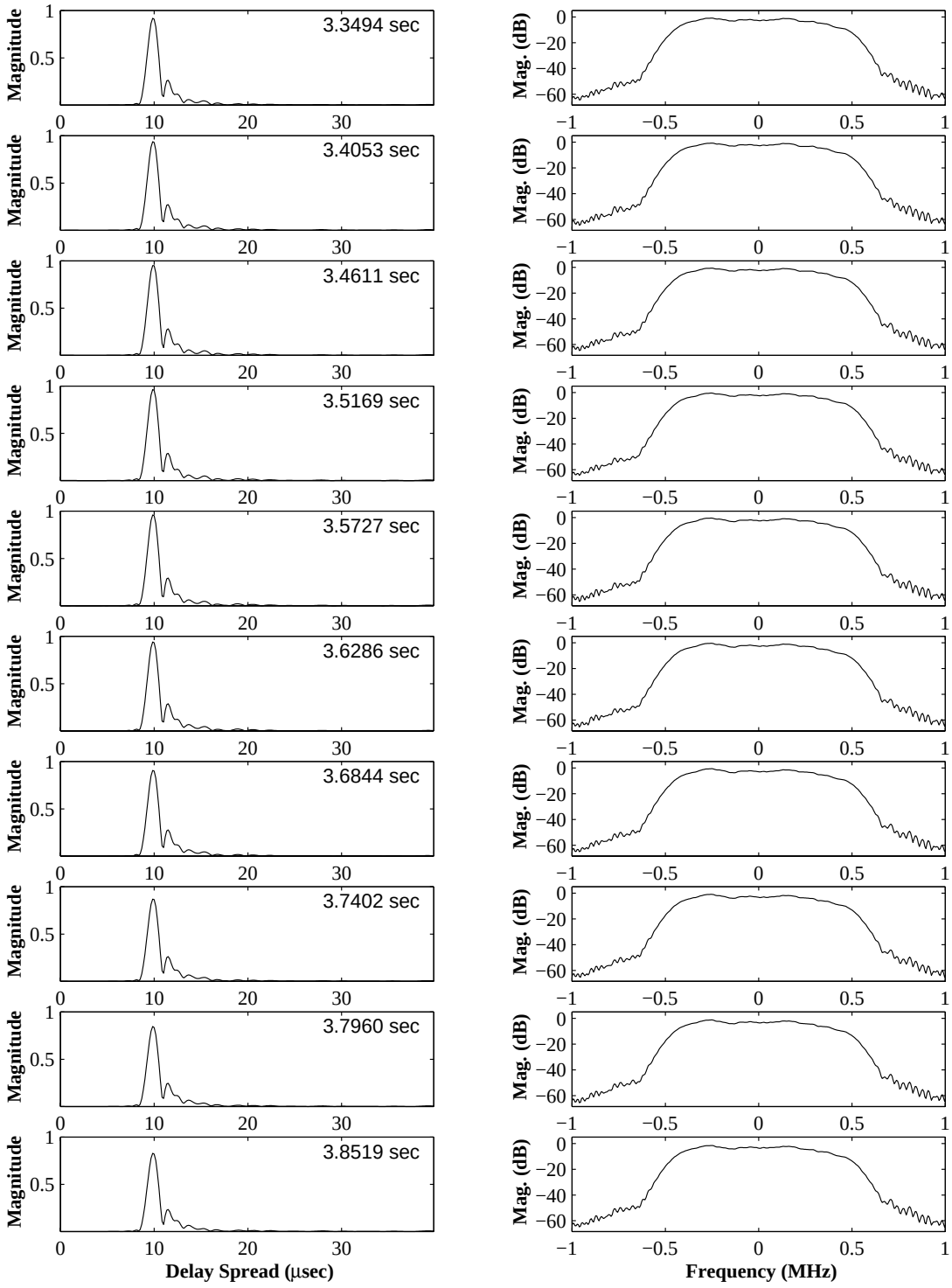

Figure 3.11: Local power delay profiles for ship21jan0843 (7).

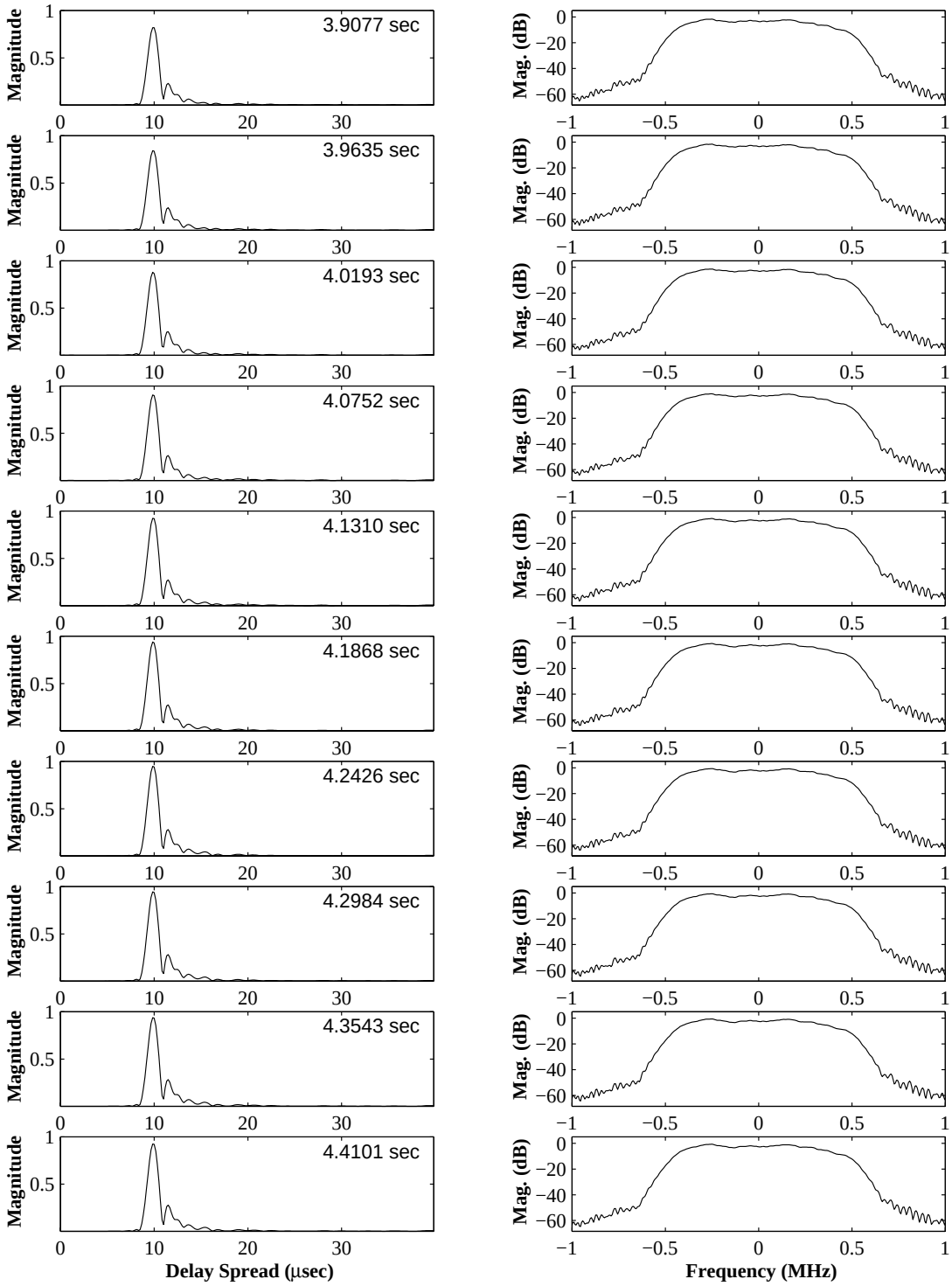

Figure 3.12: Local power delay profiles for ship21jan0843 (8).

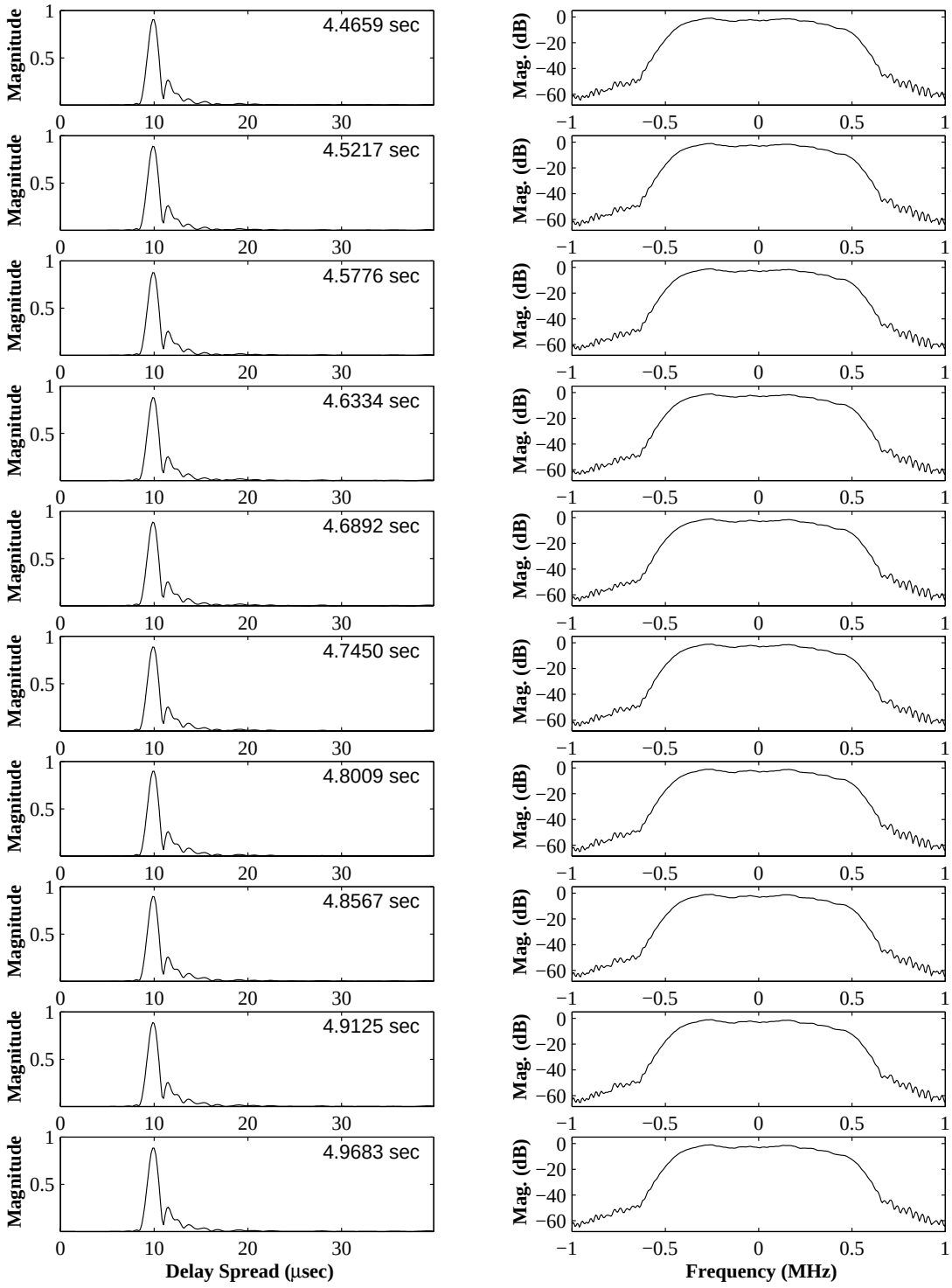

Figure 3.13: Local power delay profiles for ship21jan0843 (9).

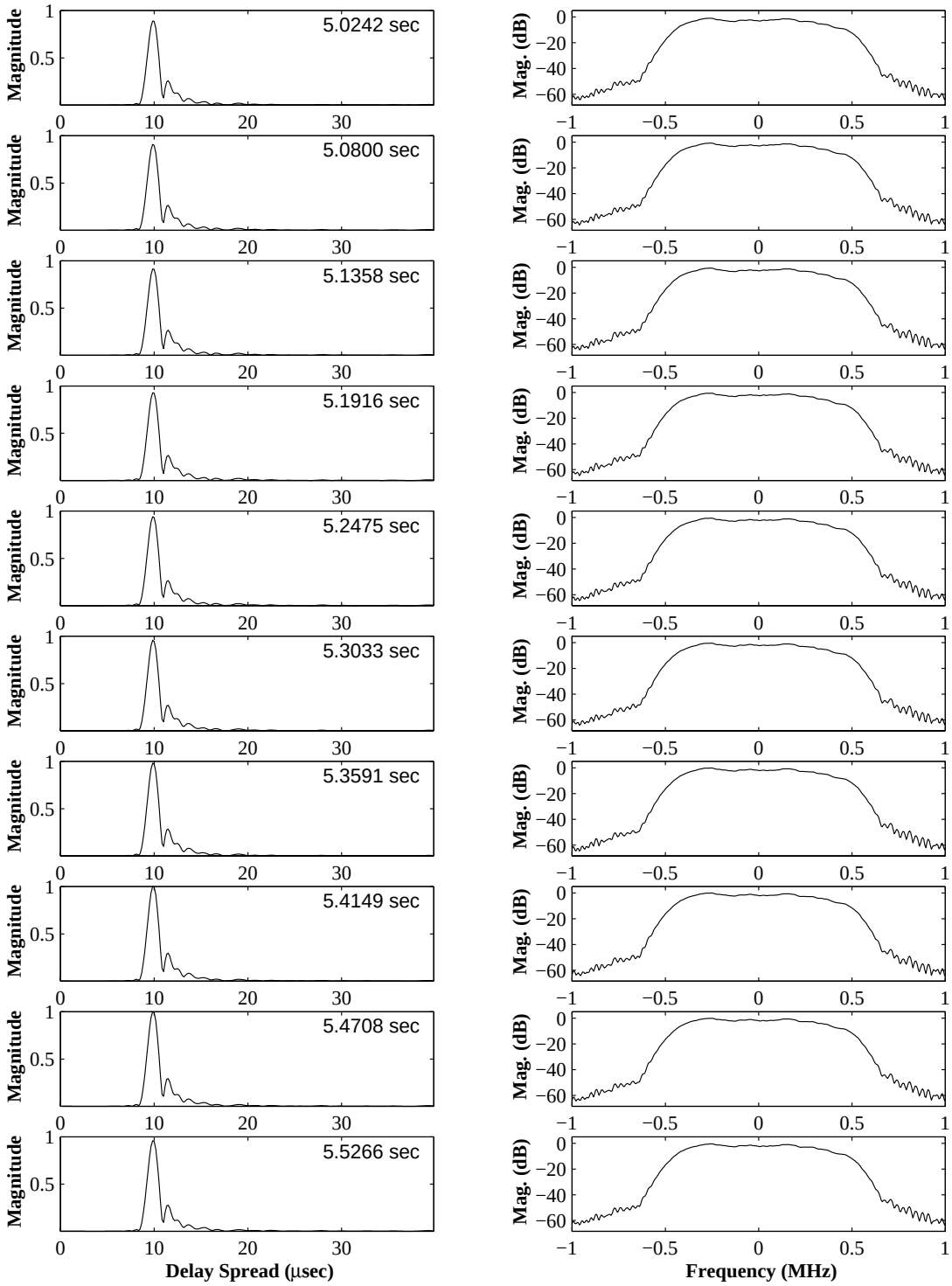

Figure 3.14: Local power delay profiles for ship21jan0843 (10).

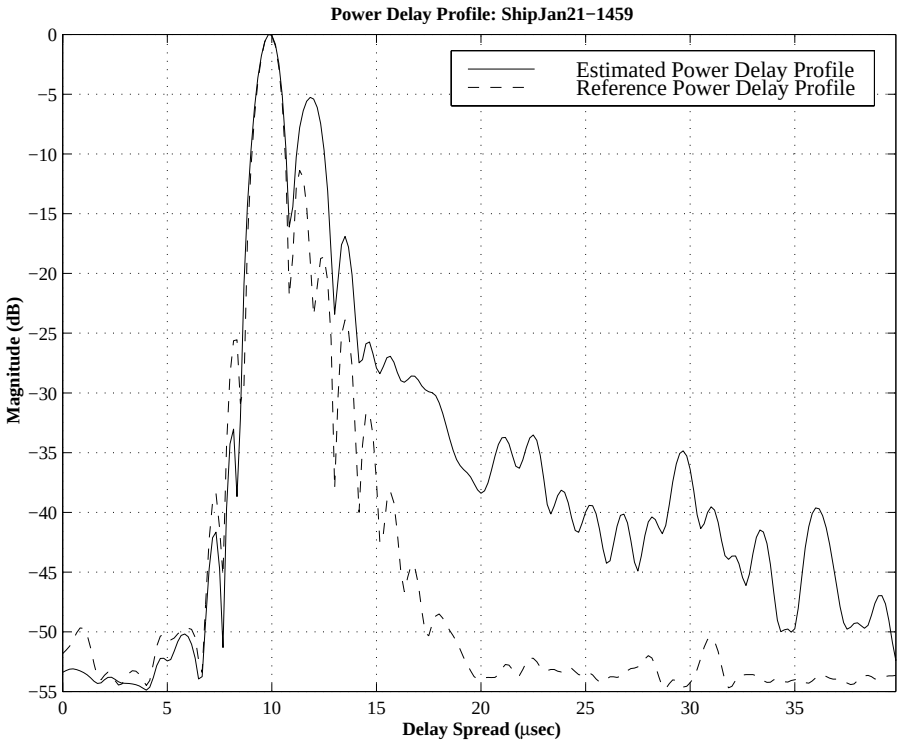

Figure 3.15: Power delay profile for ship21jan1459.

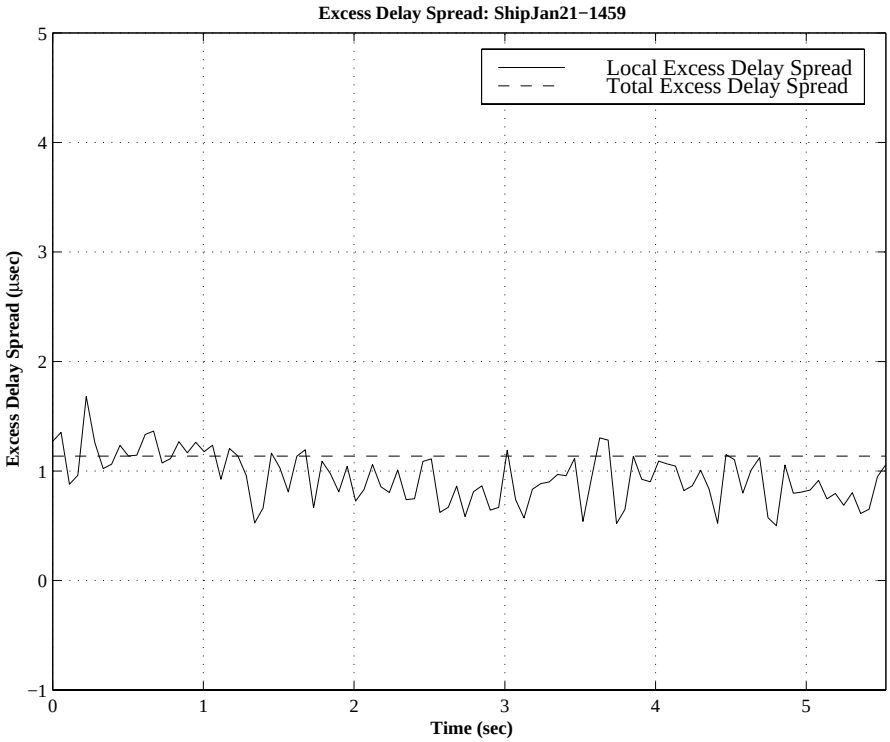

Figure 3.16: Excess delay spread for ship21jan1459.

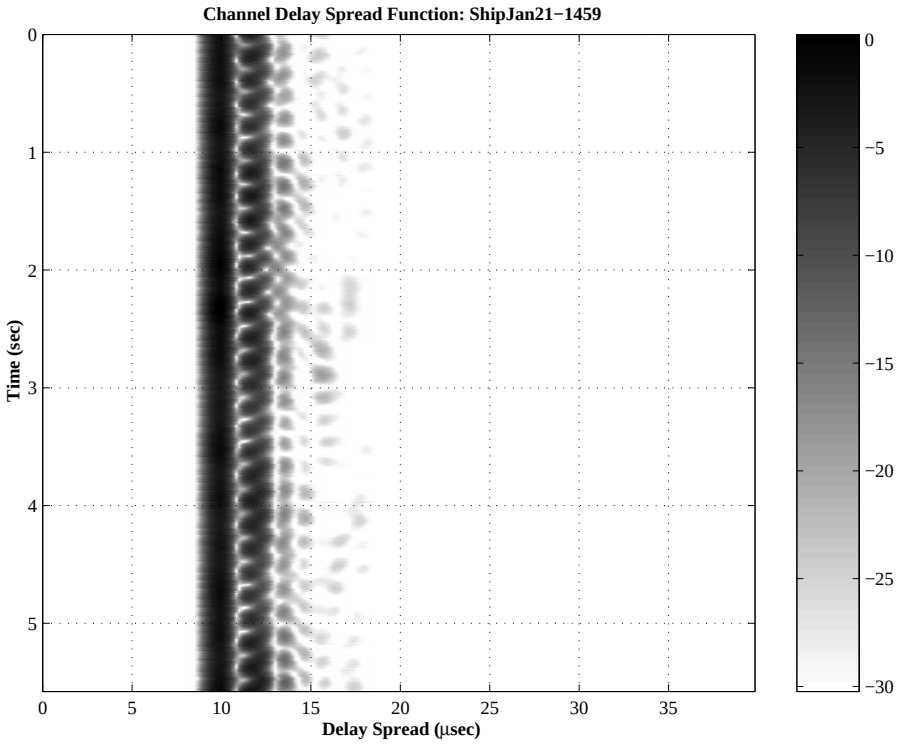

Figure 3.17: Channel delay spread function for ship21jan1459.

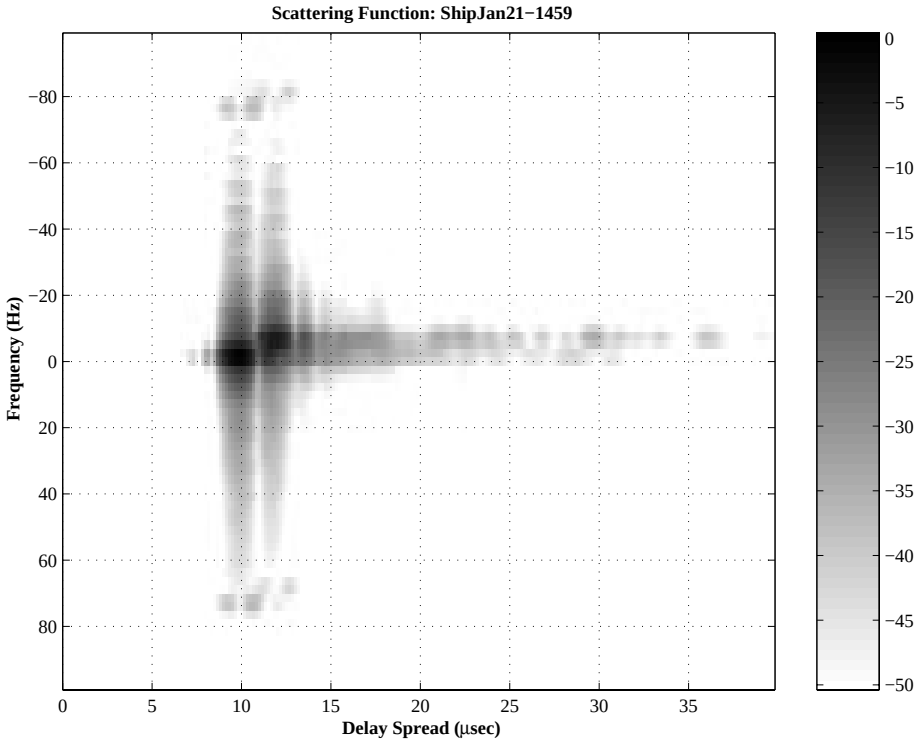

Figure 3.18: Scattering function for ship21jan1459.

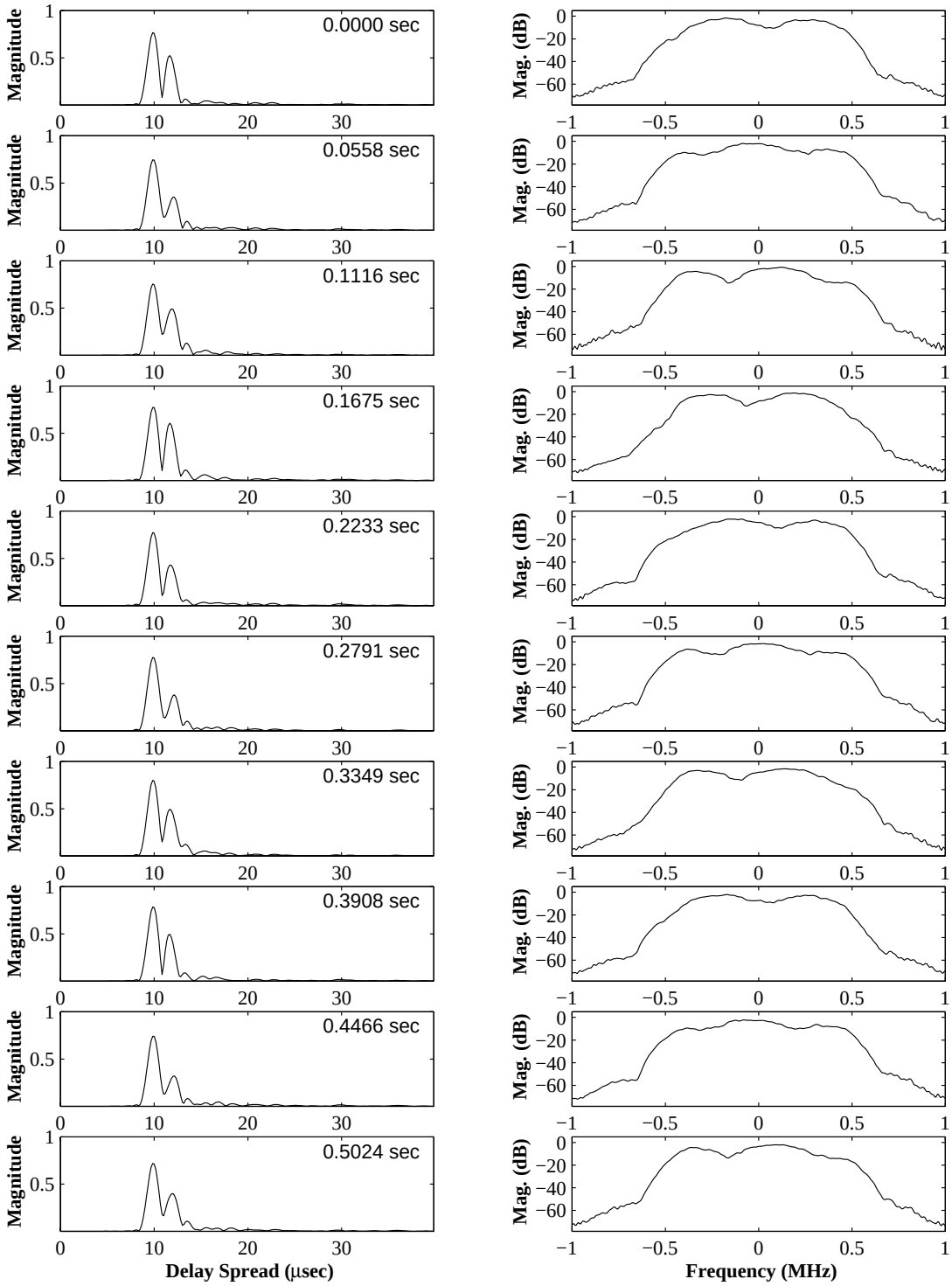

Figure 3.19: Local power delay profiles for ship21jan1459 (1).

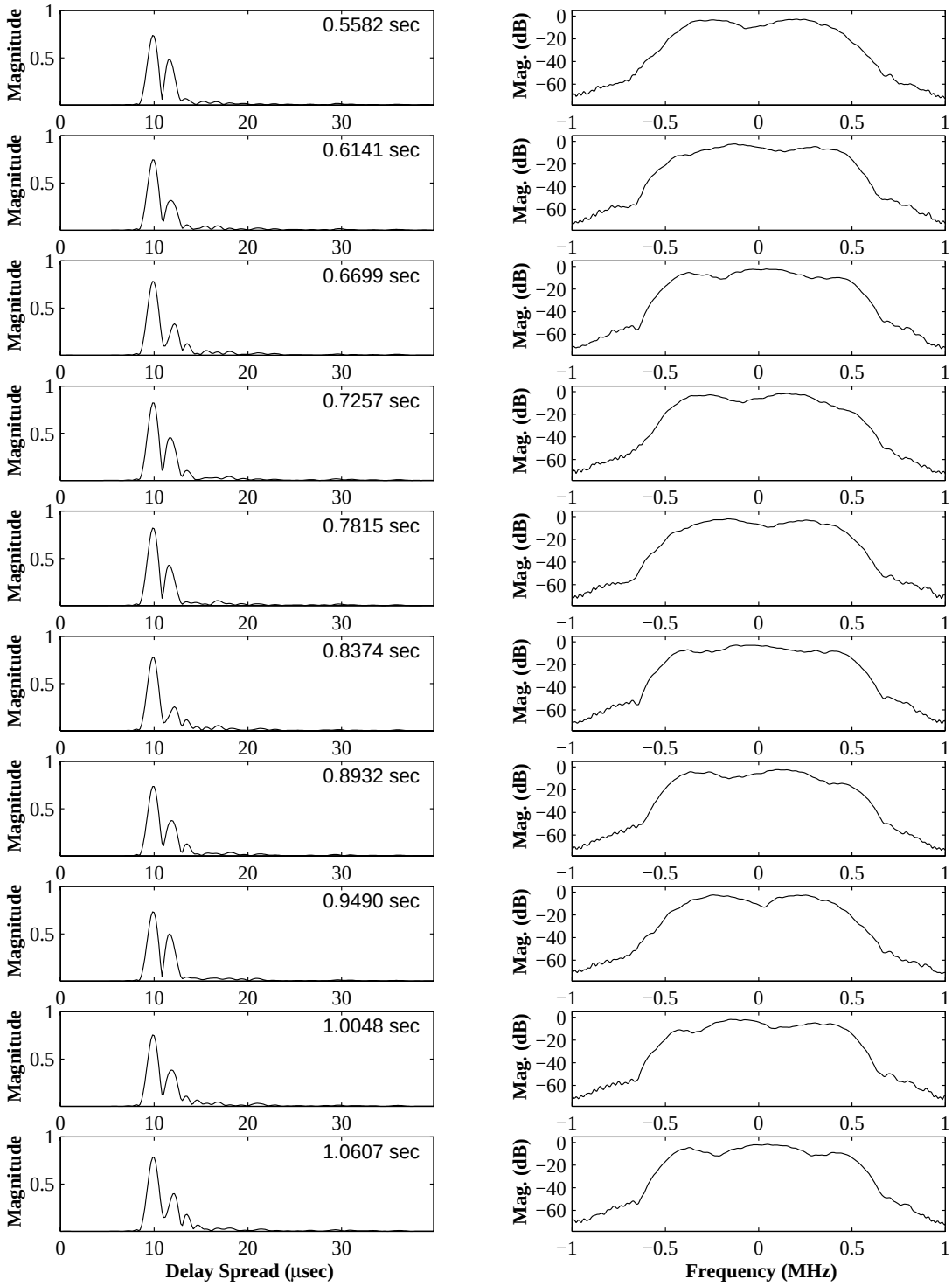

Figure 3.20: Local power delay profiles for ship21jan1459 (2).

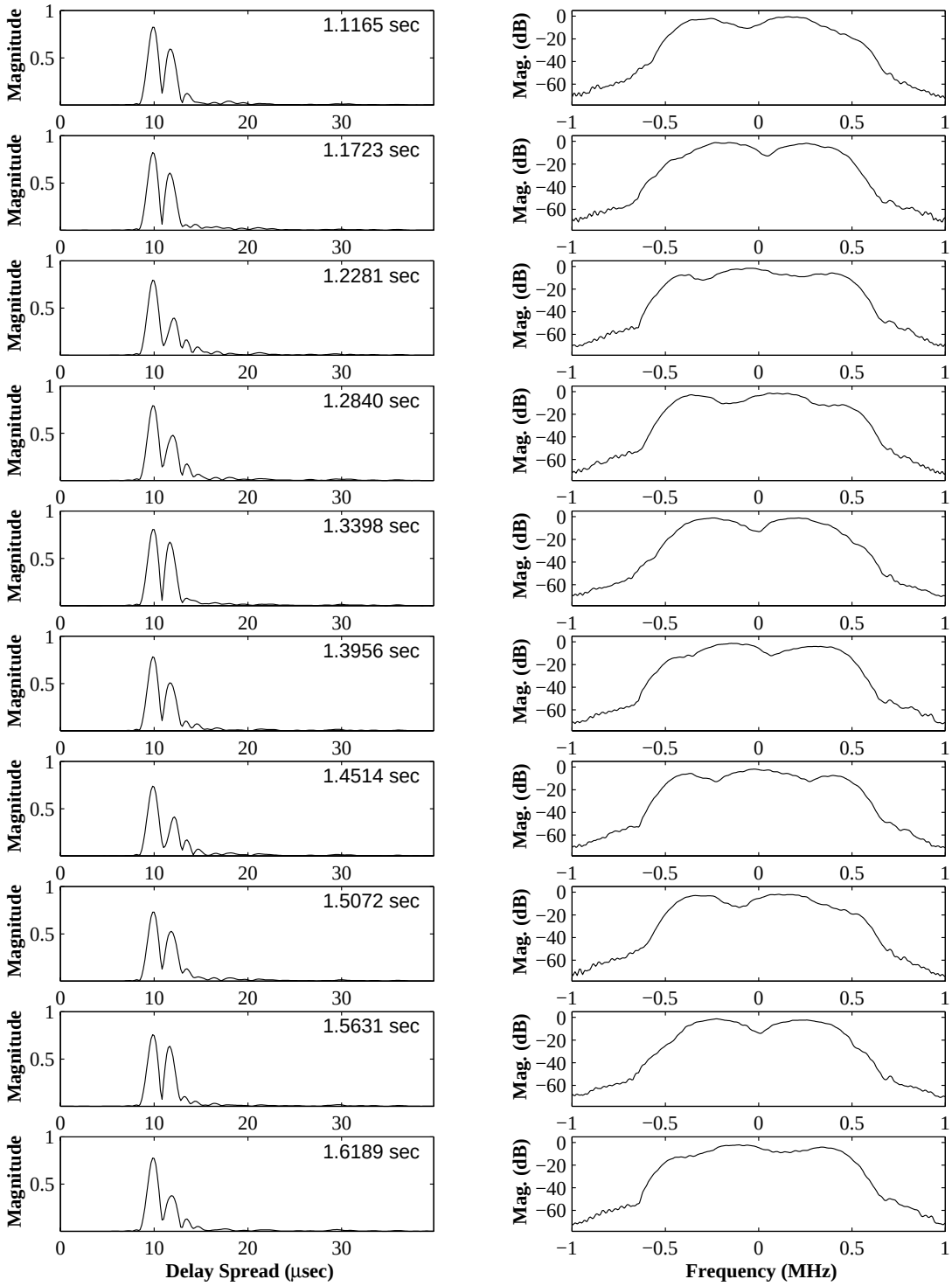

Figure 3.21: Local power delay profiles for ship21jan1459 (3).

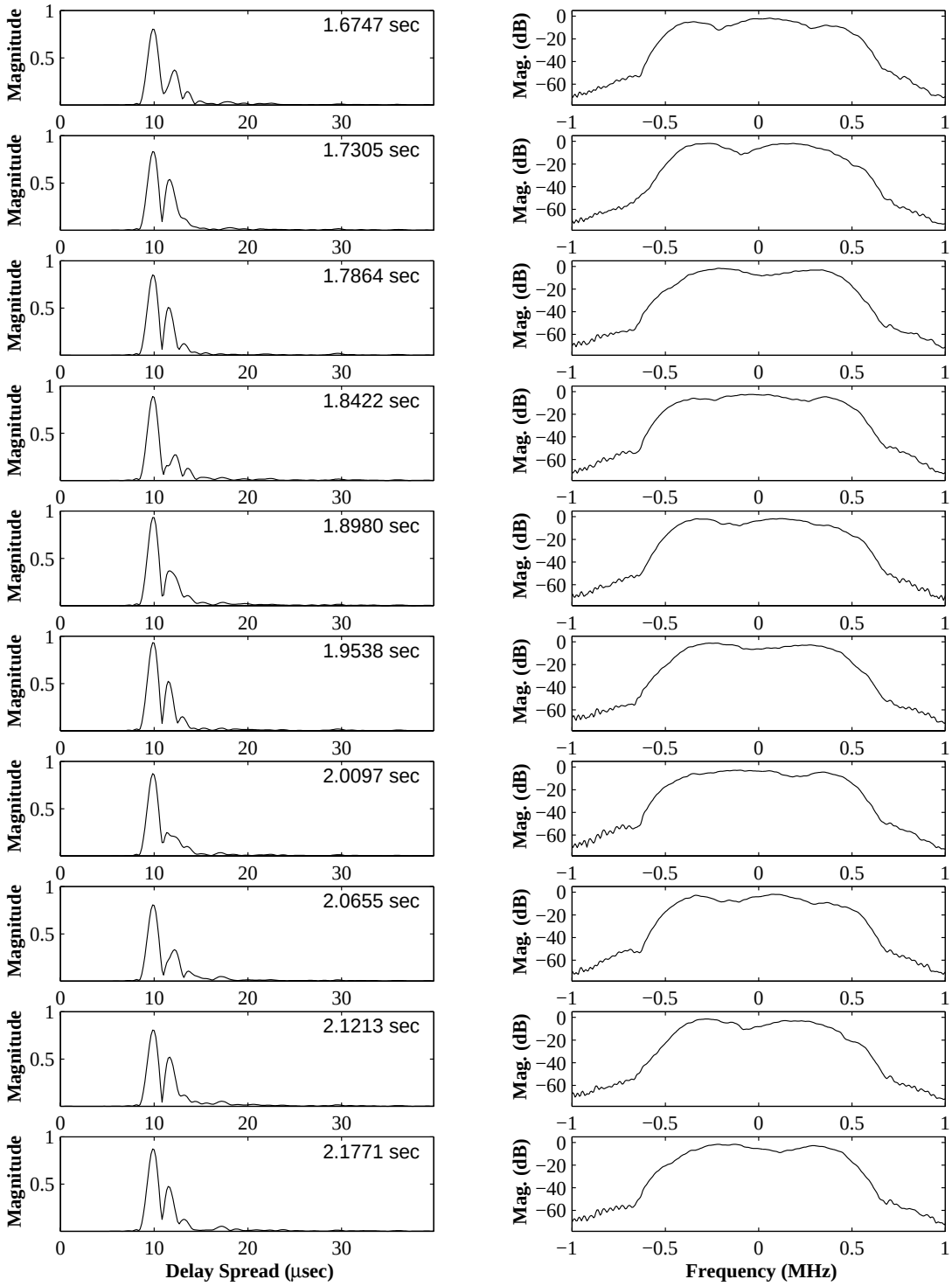

Figure 3.22: Local power delay profiles for ship21jan1459 (4).

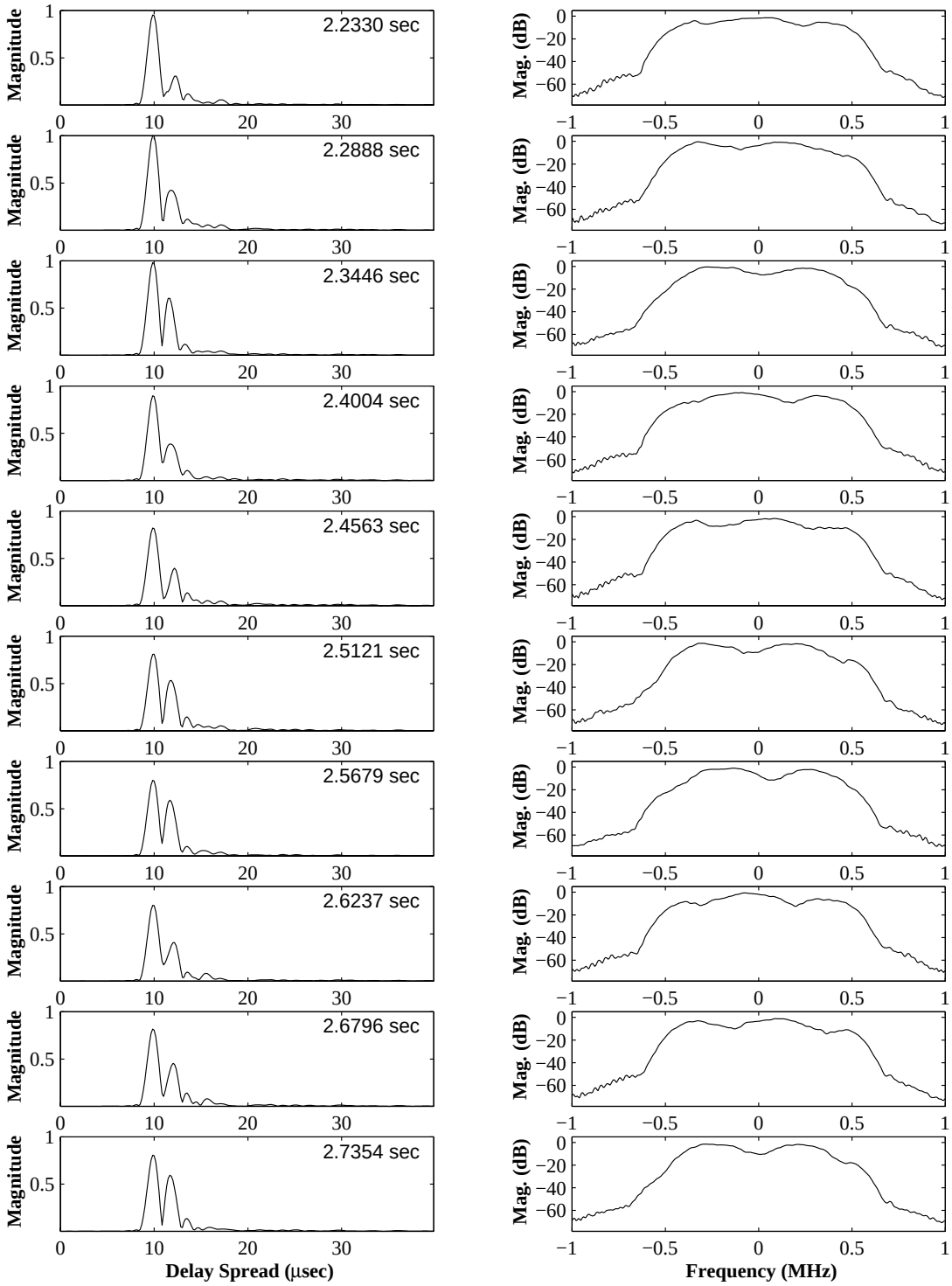

Figure 3.23: Local power delay profiles for ship21jan1459 (5).

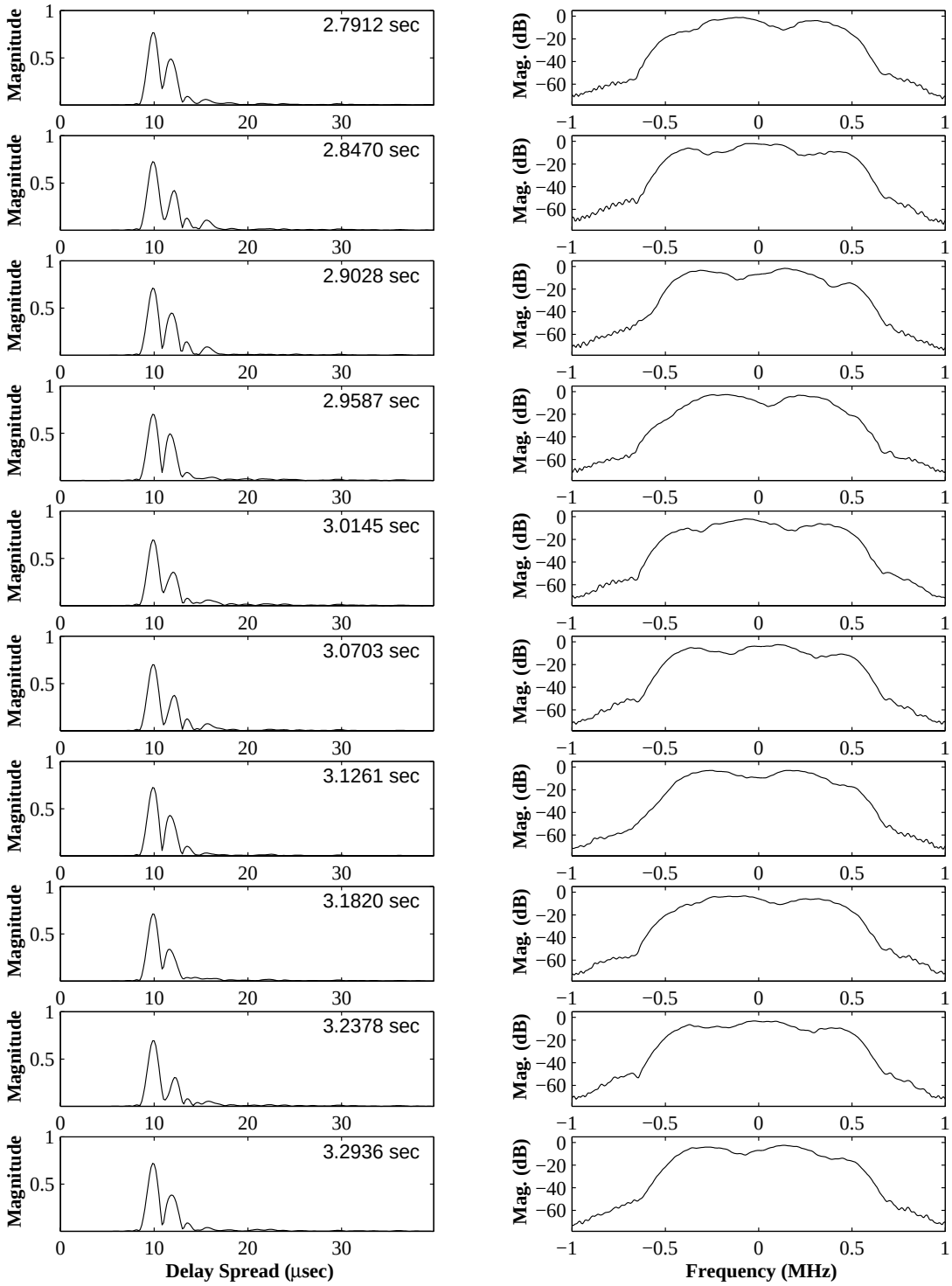

Figure 3.24: Local power delay profiles for ship21jan1459 (6).

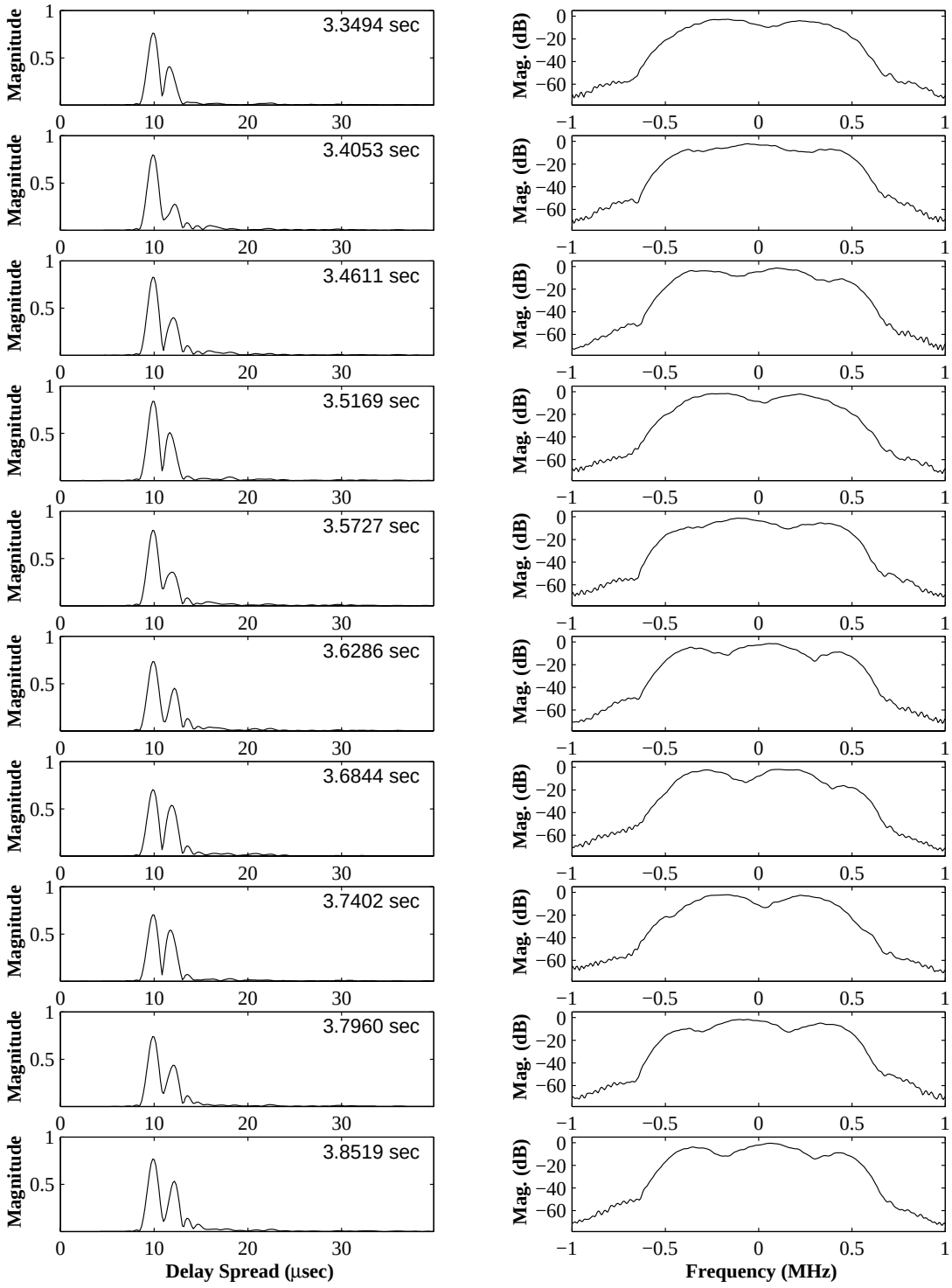

Figure 3.25: Local power delay profiles for ship21jan1459 (7).

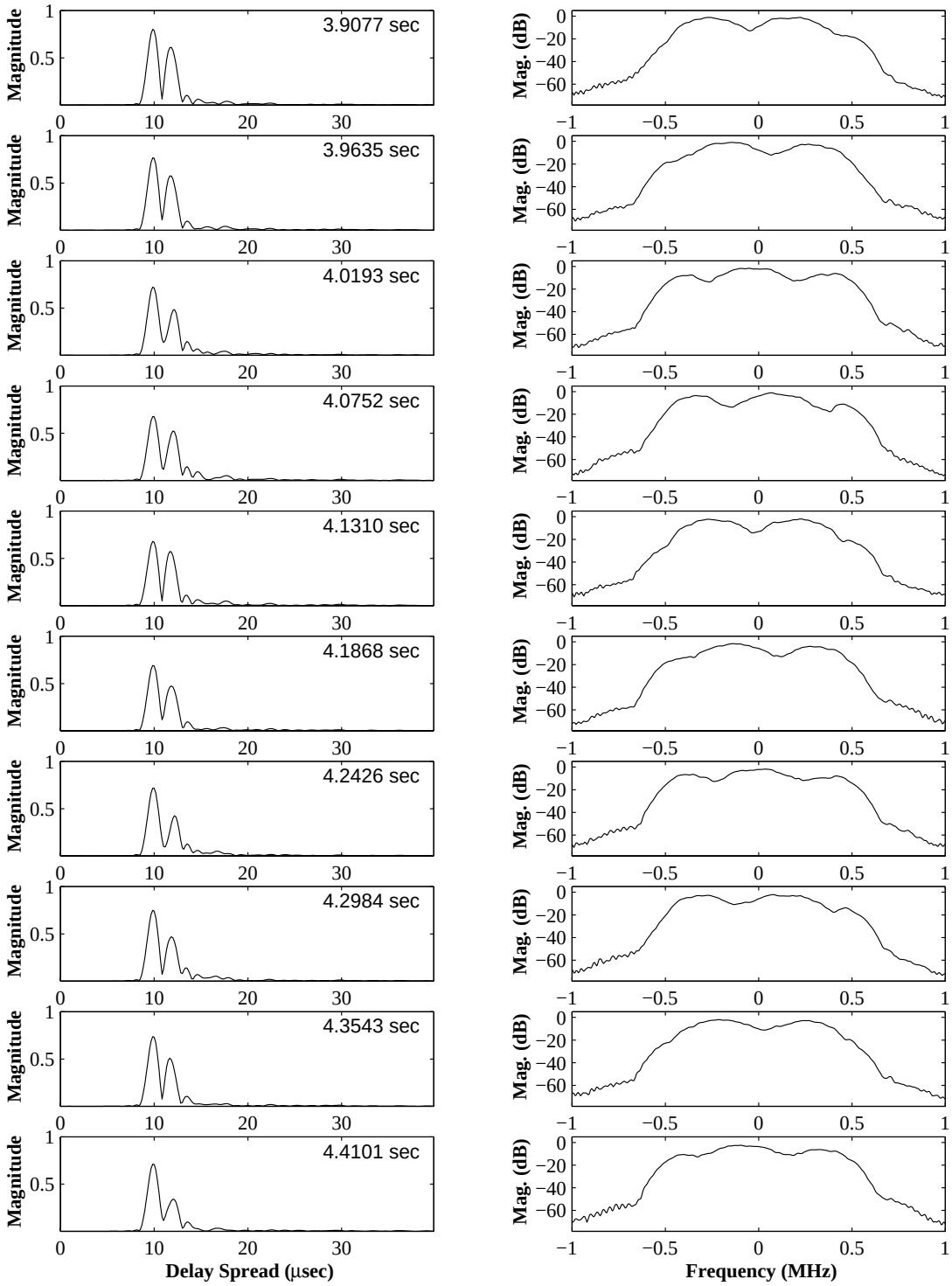

Figure 3.26: Local power delay profiles for ship21jan1459 (8).

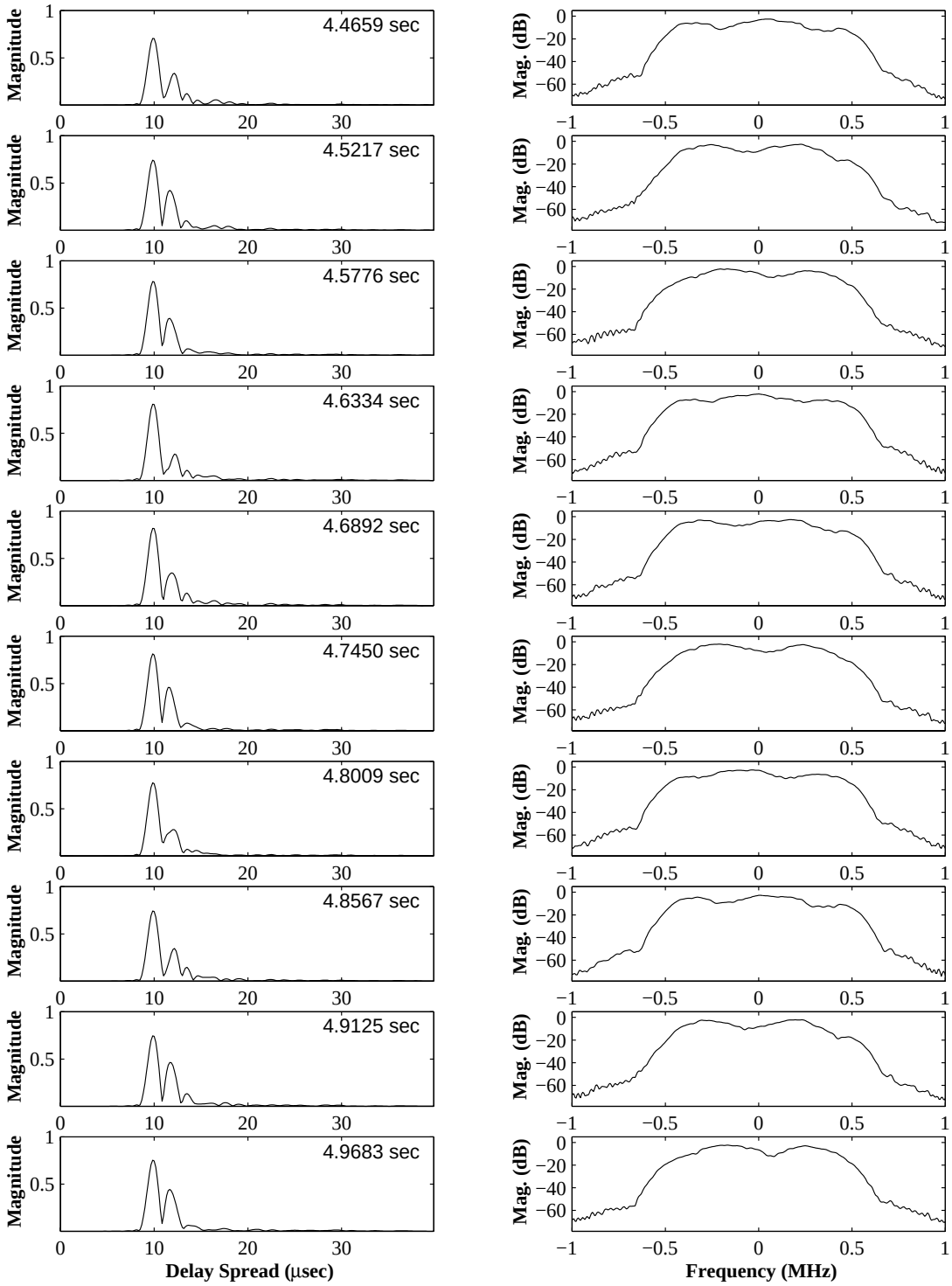

Figure 3.27: Local power delay profiles for ship21jan1459 (9).

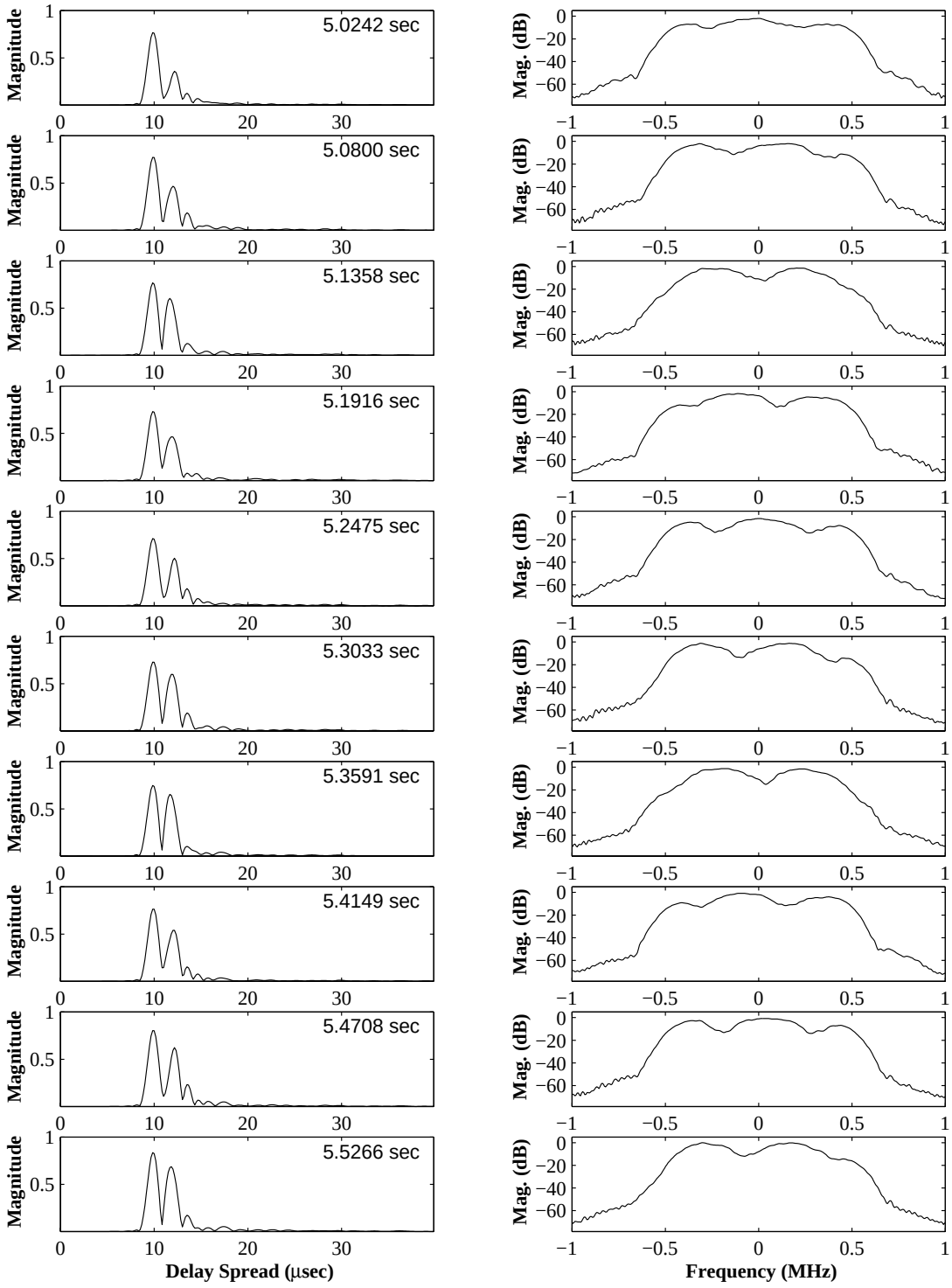

Figure 3.28: Local power delay profiles for ship21jan1459 (10).

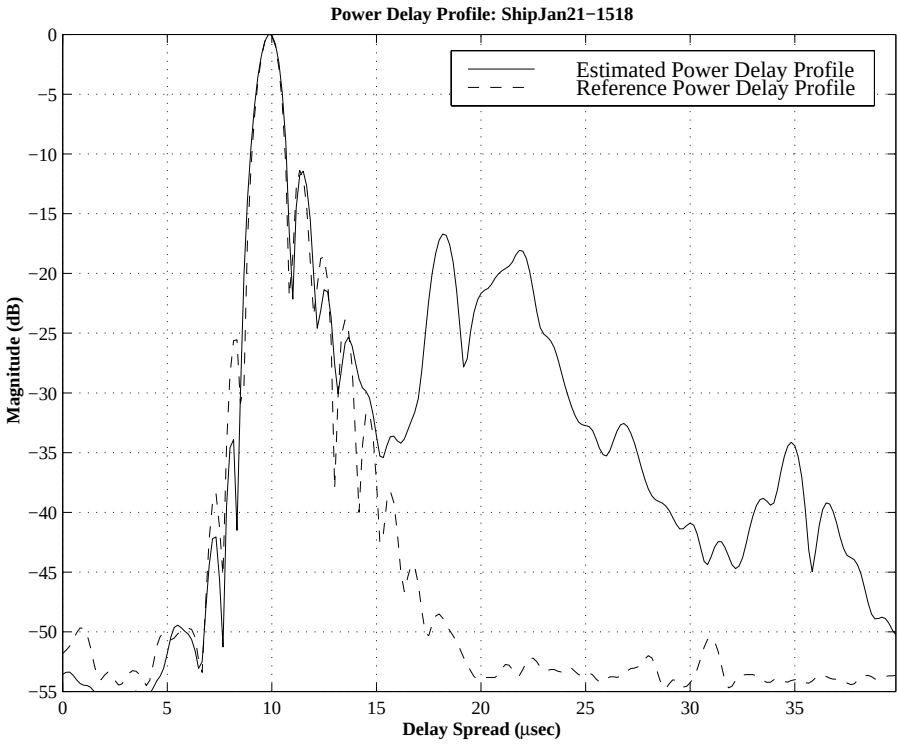

Figure 3.29: Power delay profile for ship21jan1518.

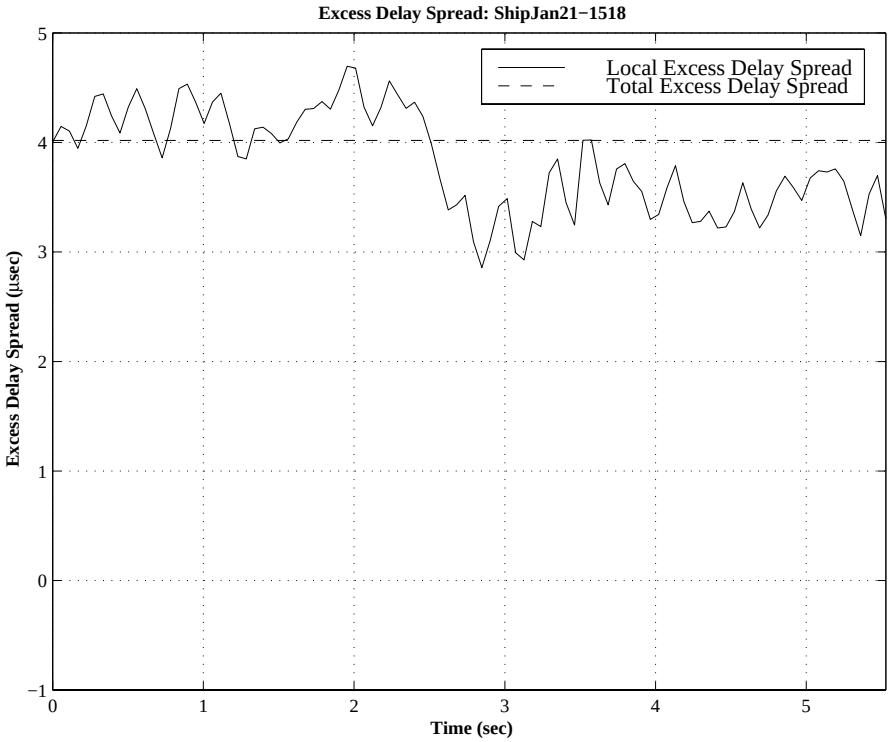

Figure 3.30: Excess delay spread for ship21jan1518.

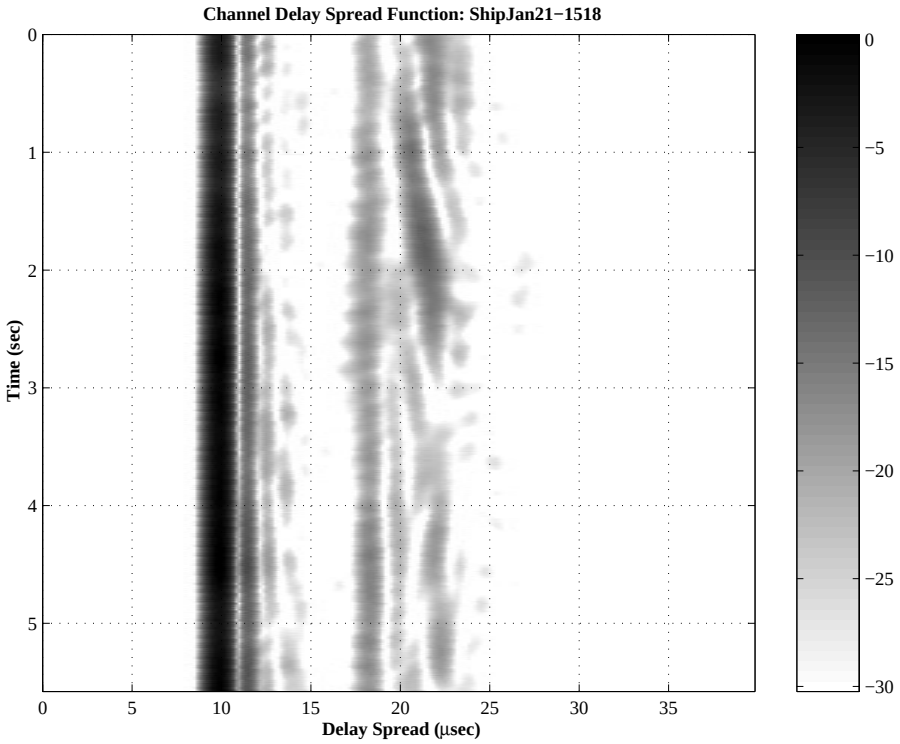

Figure 3.31: Channel delay spread function for ship21jan1518.

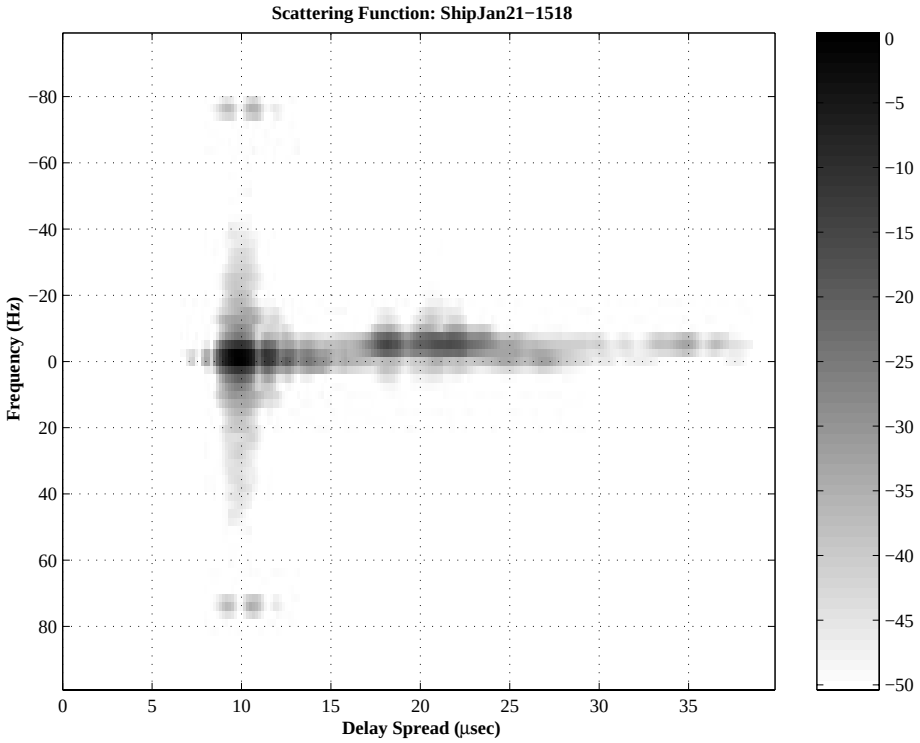

Figure 3.32: Scattering function for ship21jan1518.

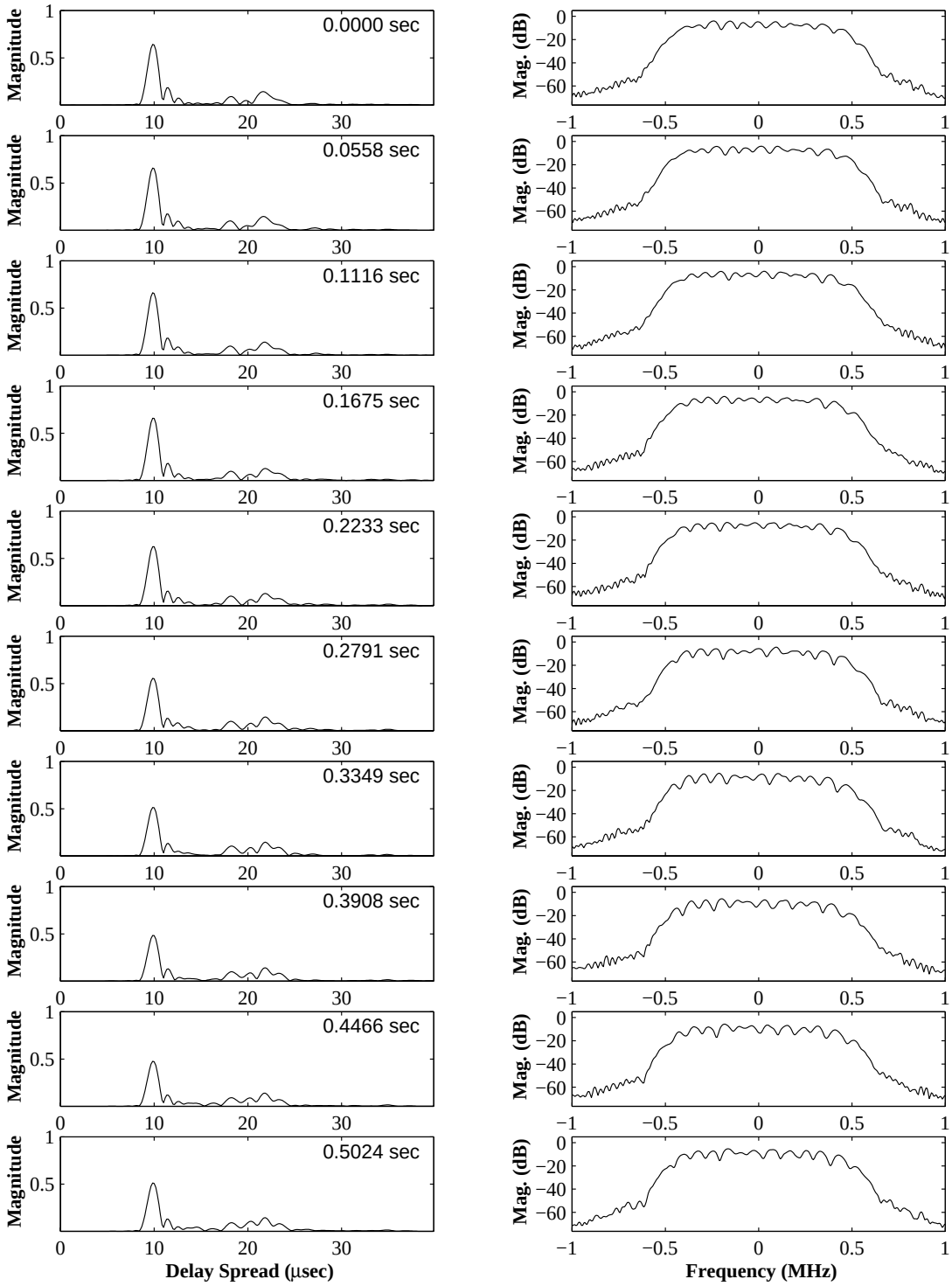

Figure 3.33: Local power delay profiles for ship21jan1518 (1).

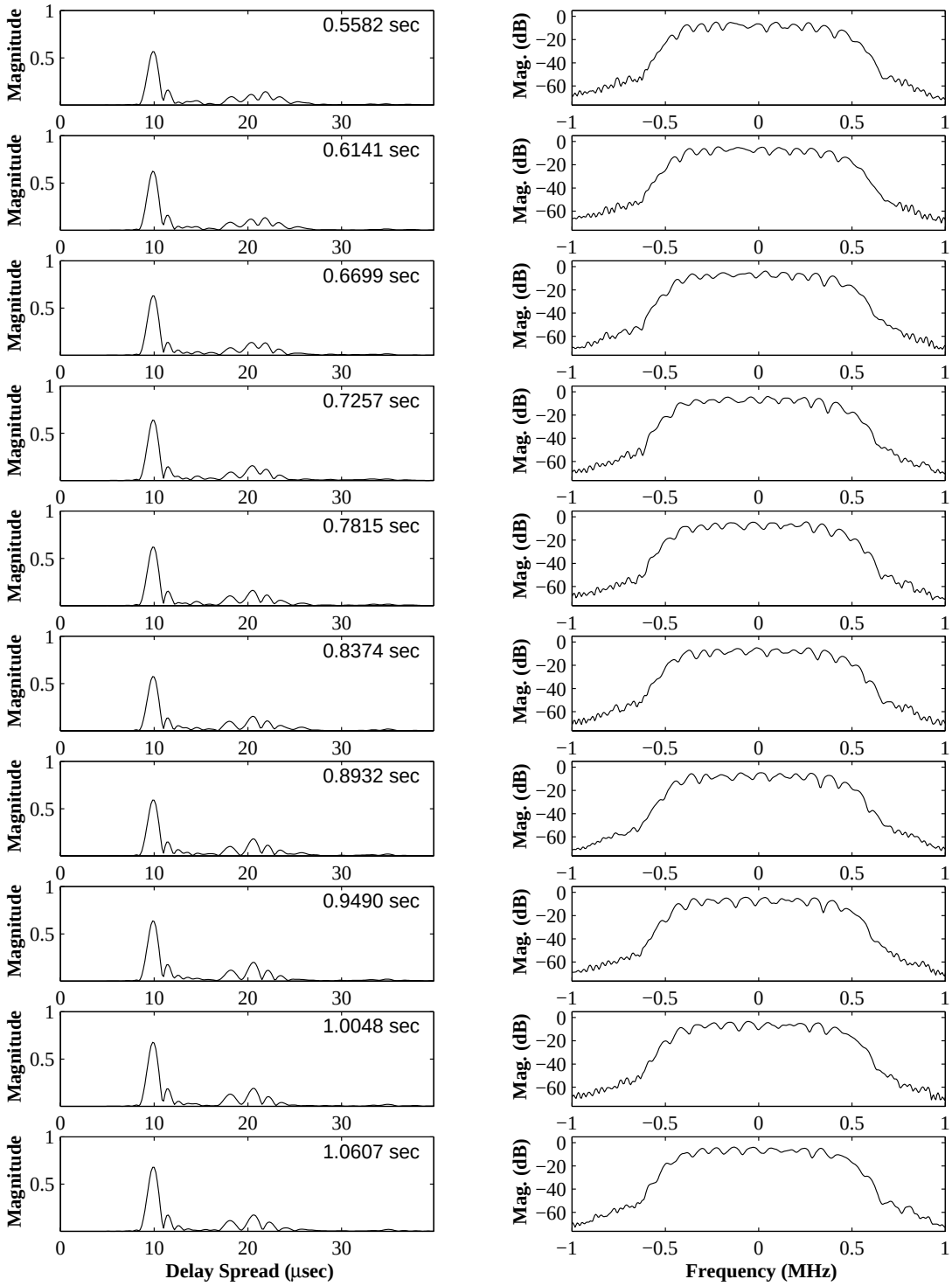

Figure 3.34: Local power delay profiles for ship21jan1518 (2).

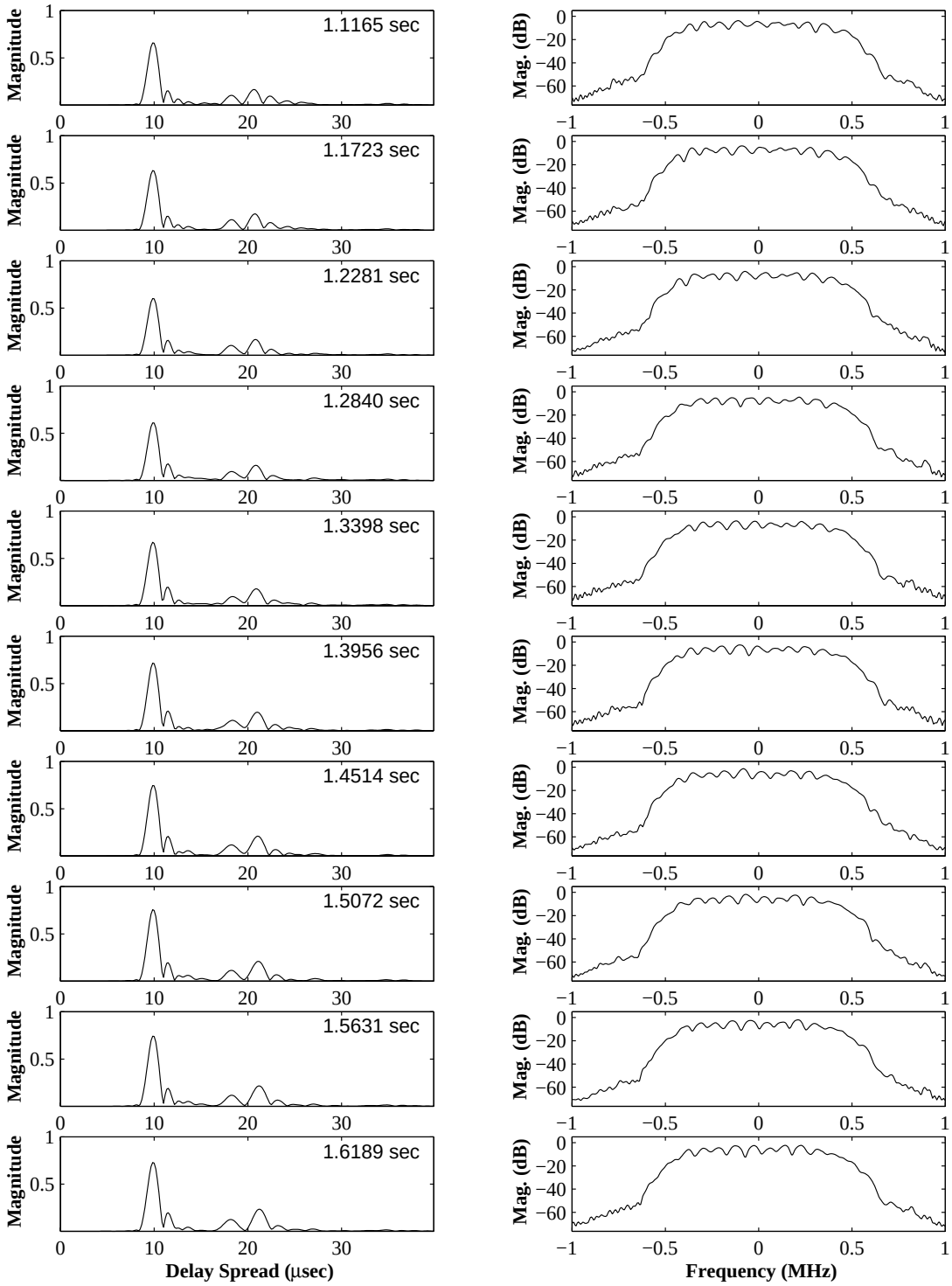

Figure 3.35: Local power delay profiles for ship21jan1518 (3).

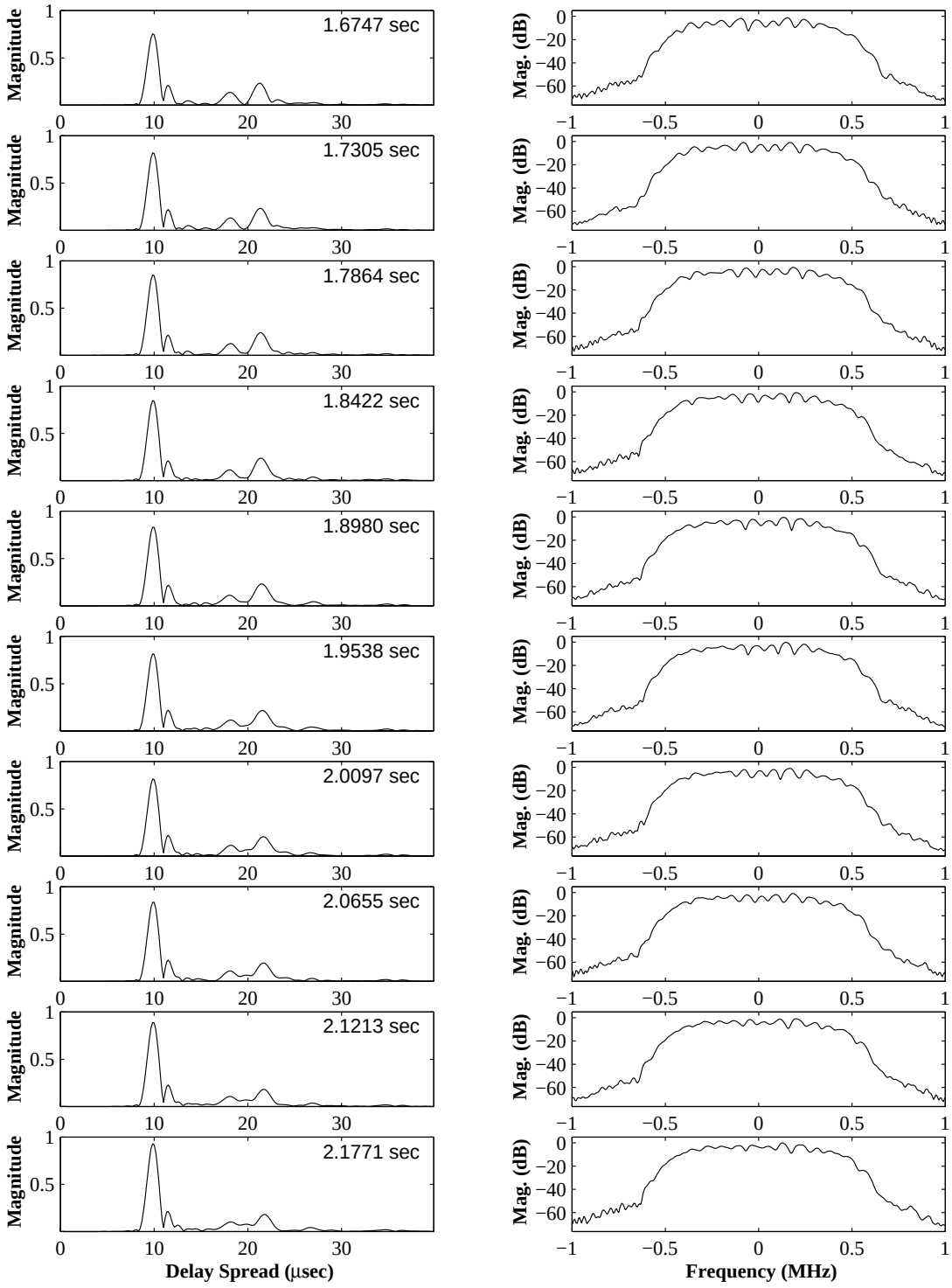

Figure 3.36: Local power delay profiles for ship21jan1518 (4).

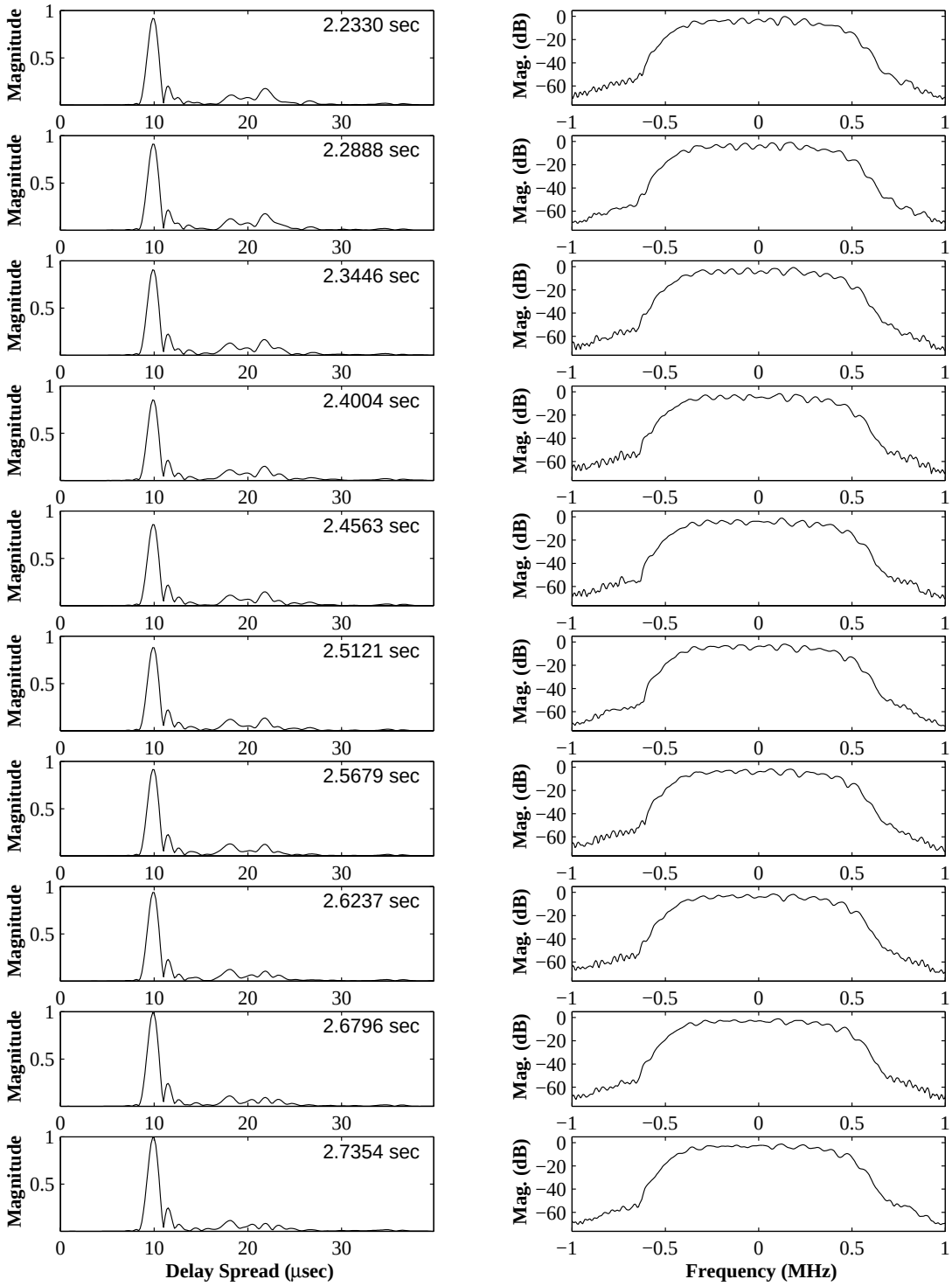

Figure 3.37: Local power delay profiles for ship21jan1518 (5).

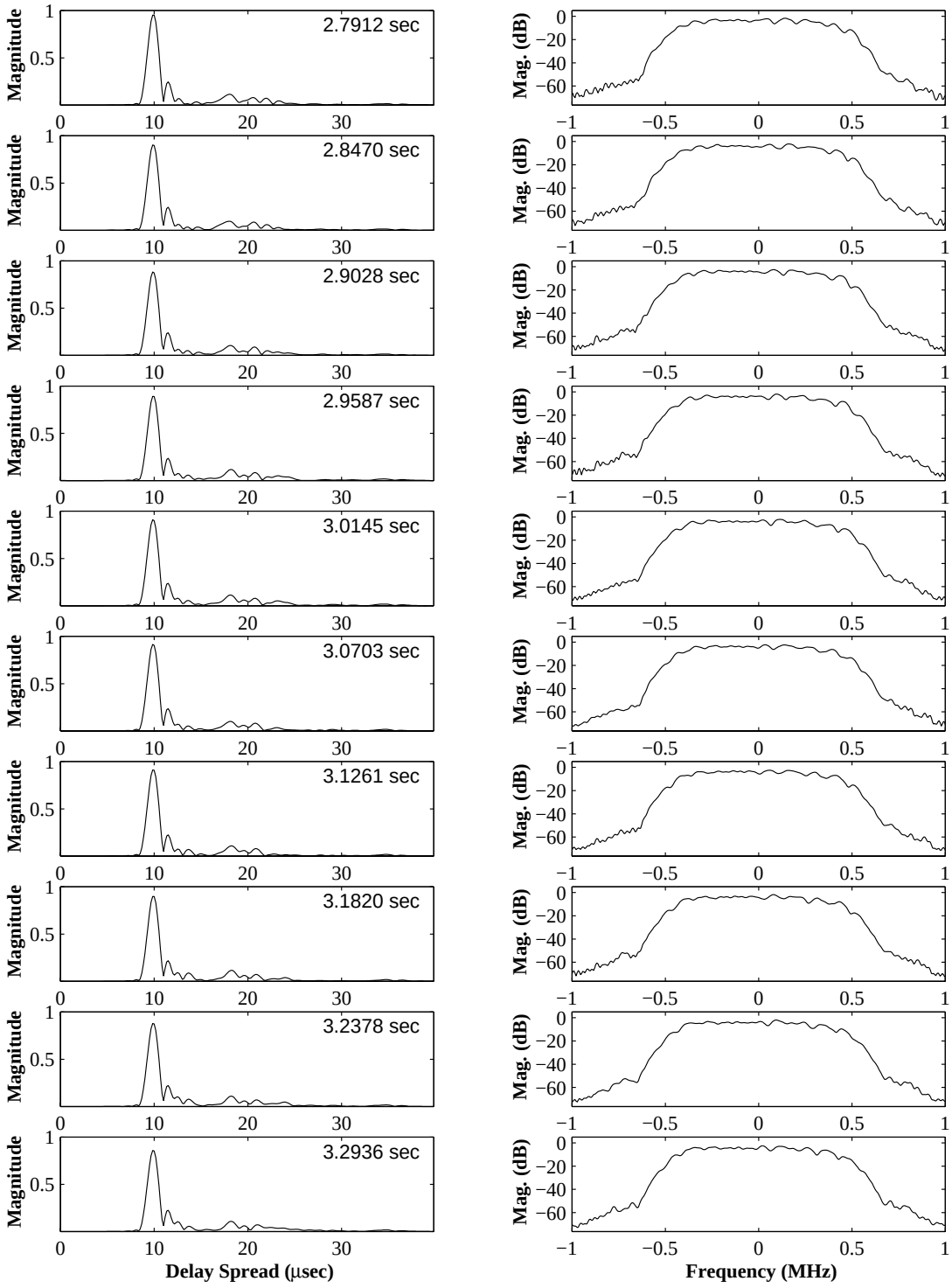

Figure 3.38: Local power delay profiles for ship21jan1518 (6).

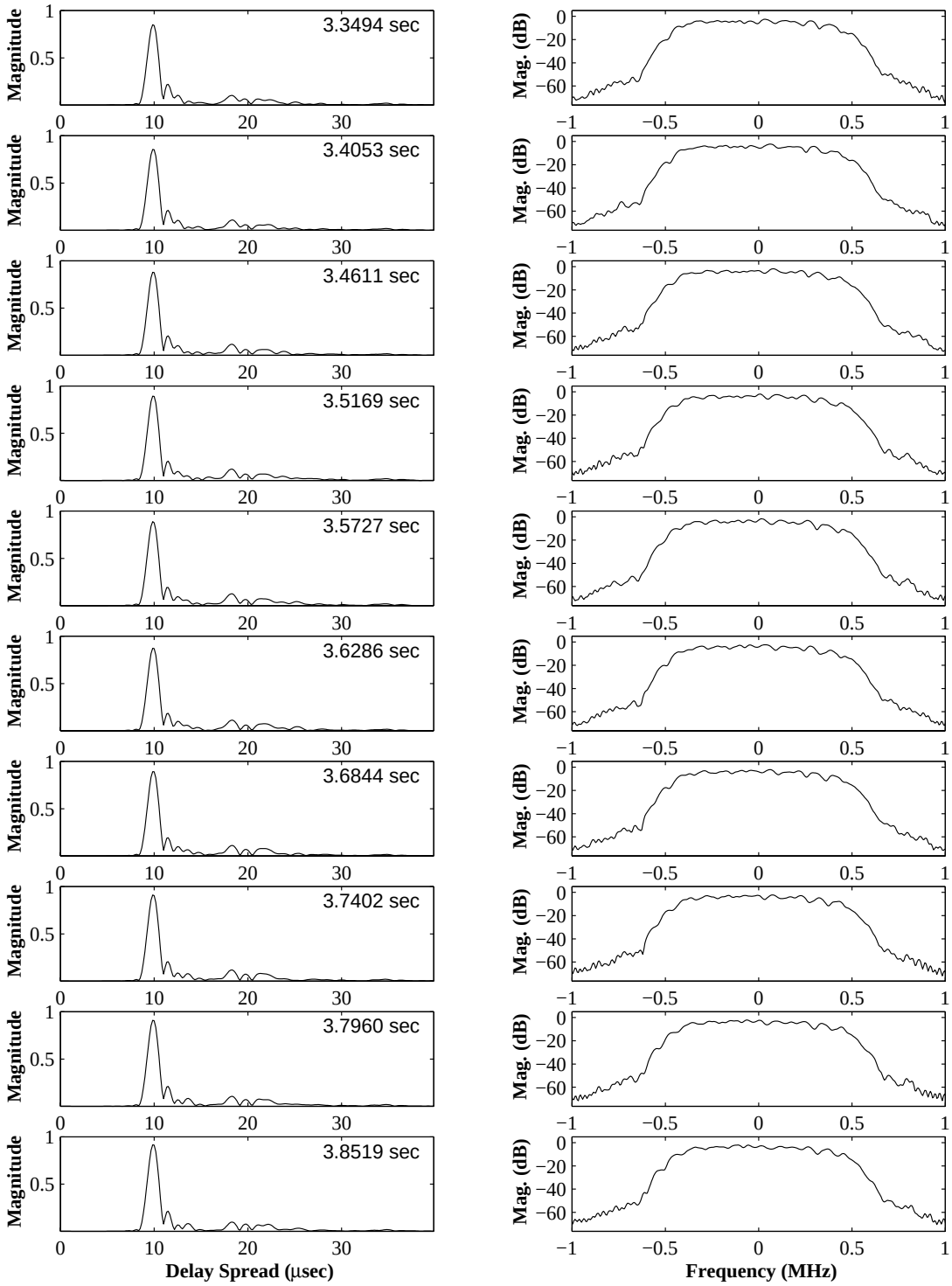

Figure 3.39: Local power delay profiles for ship21jan1518 (7).

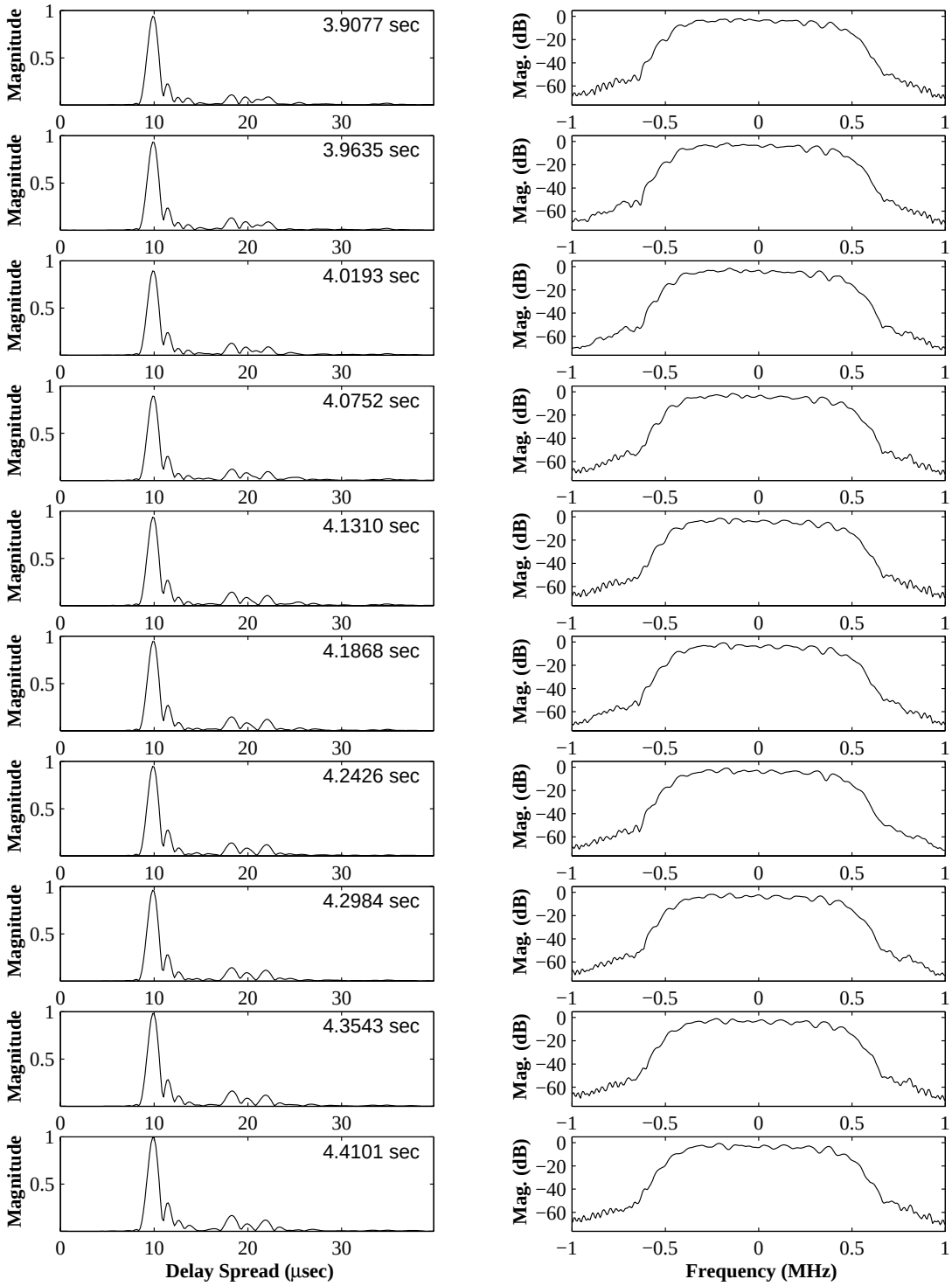

Figure 3.40: Local power delay profiles for ship21jan1518 (8).

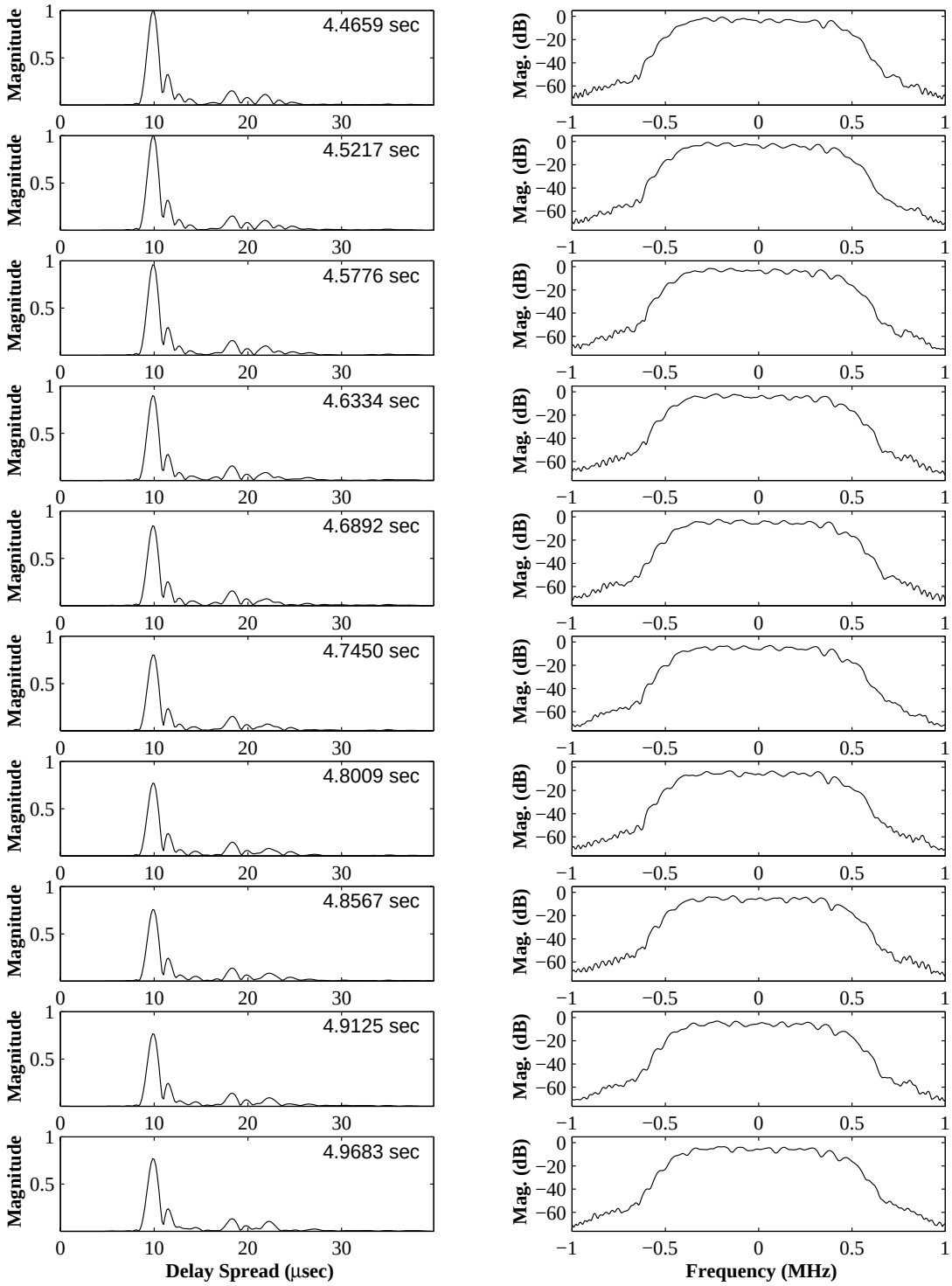

Figure 3.41: Local power delay profiles for ship21jan1518 (9).

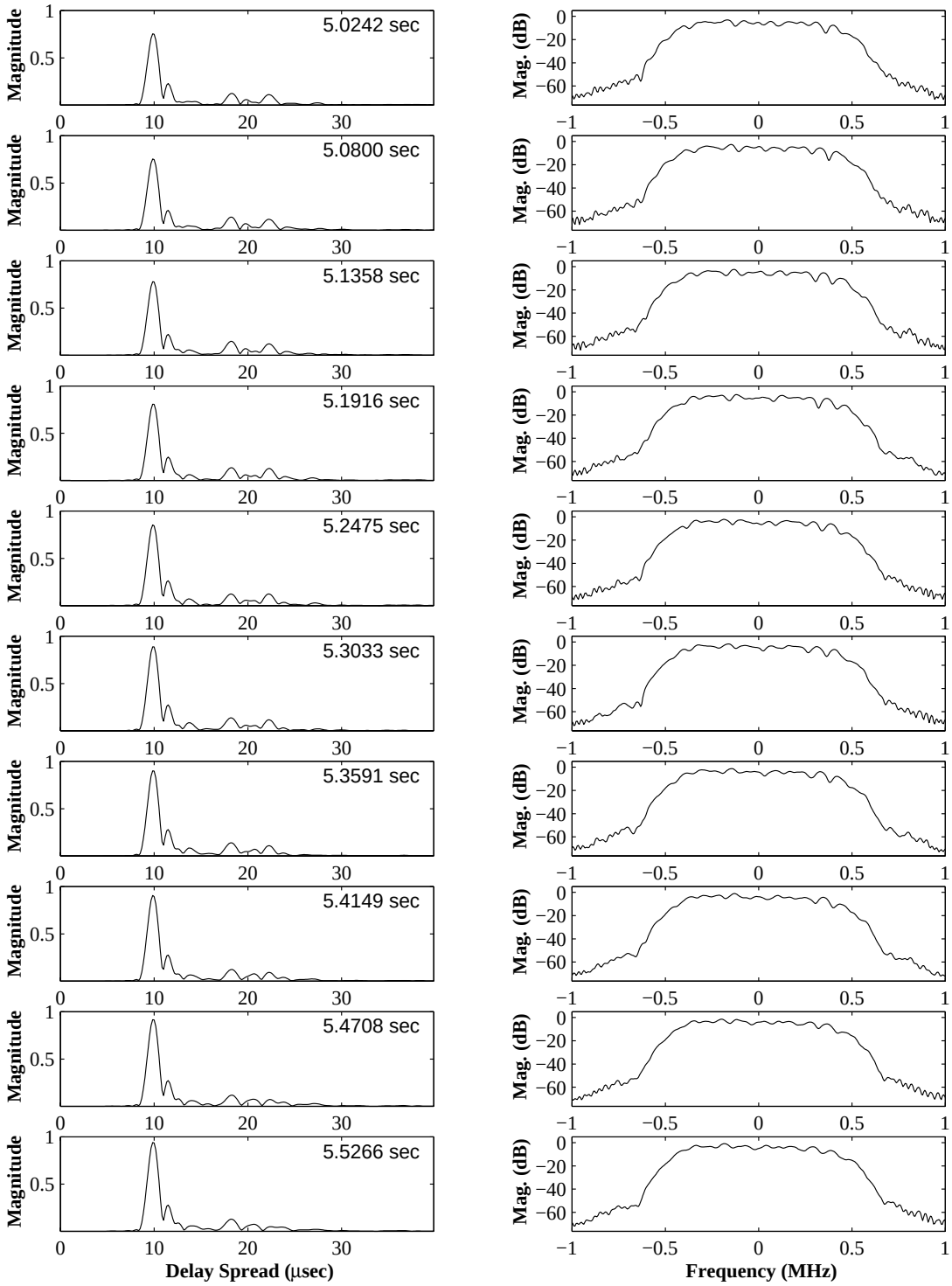

Figure 3.42: Local power delay profiles for ship21jan1518 (10).

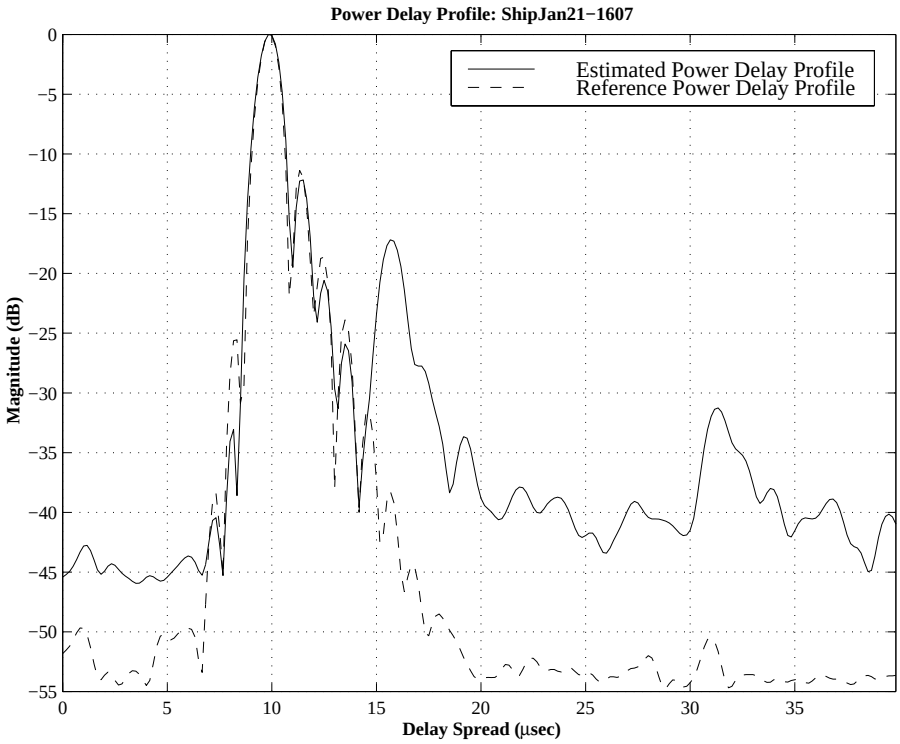

Figure 3.43: Power delay profile for ship21jan1607.

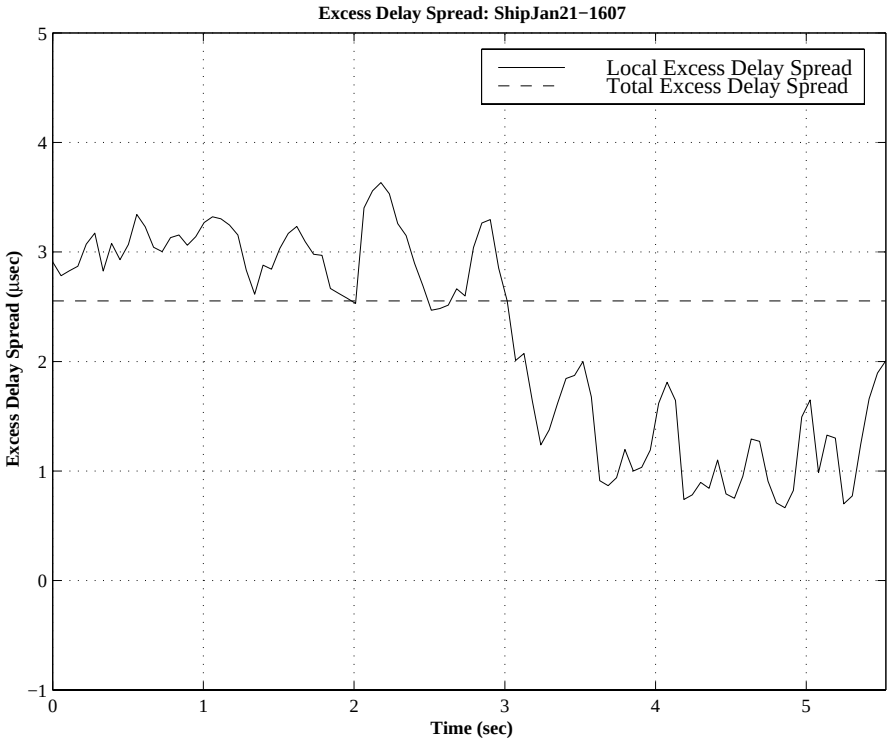

Figure 3.44: Excess delay spread for ship21jan1607.

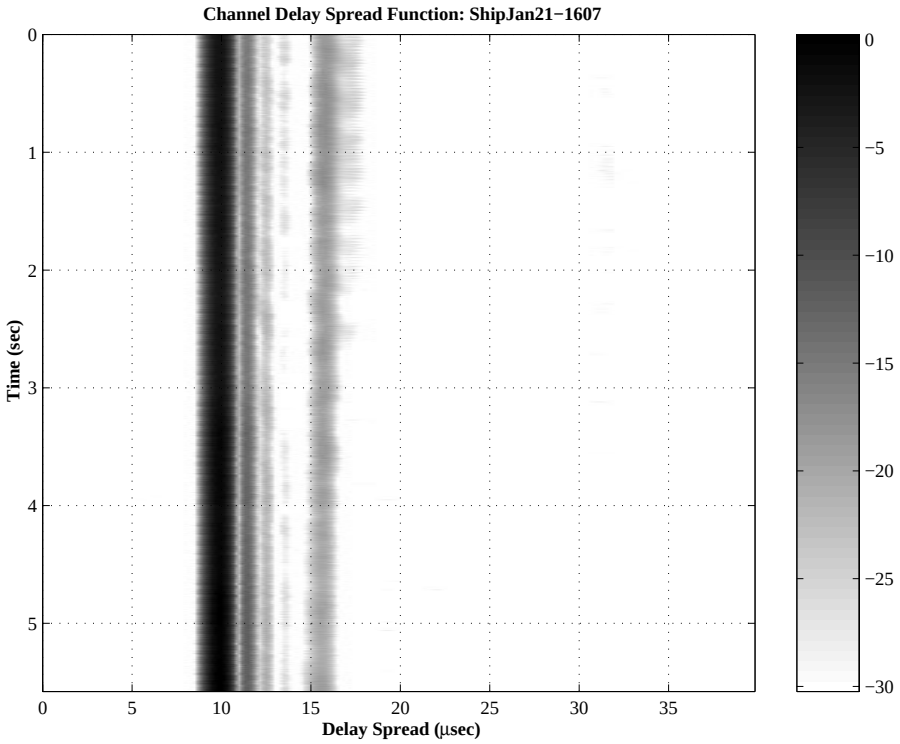

Figure 3.45: Channel delay spread function for ship21jan1607.

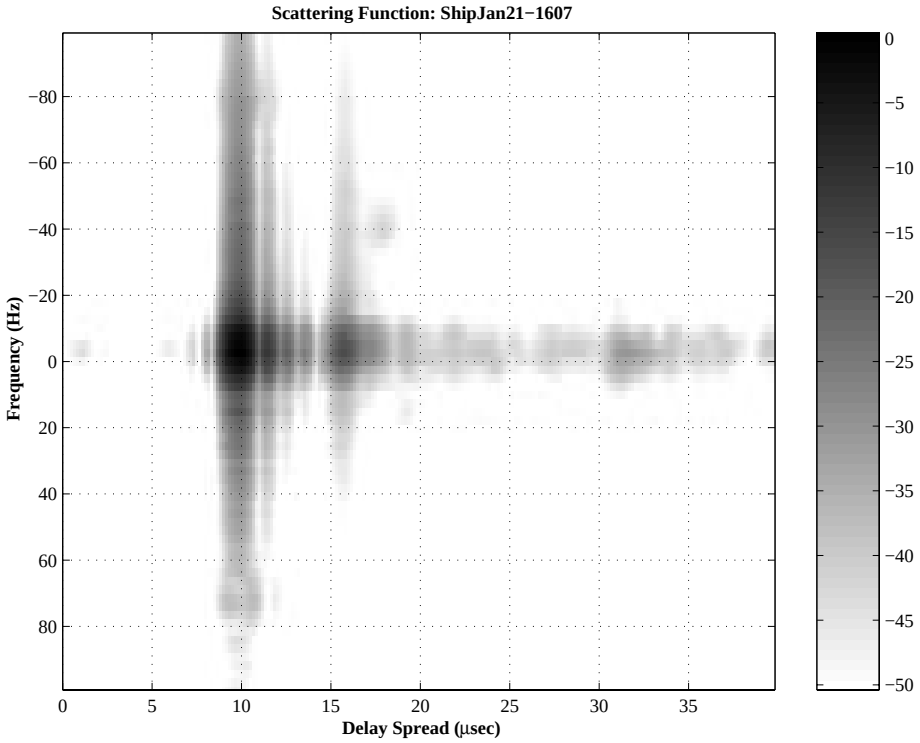

Figure 3.46: Scattering function for ship21jan1607.

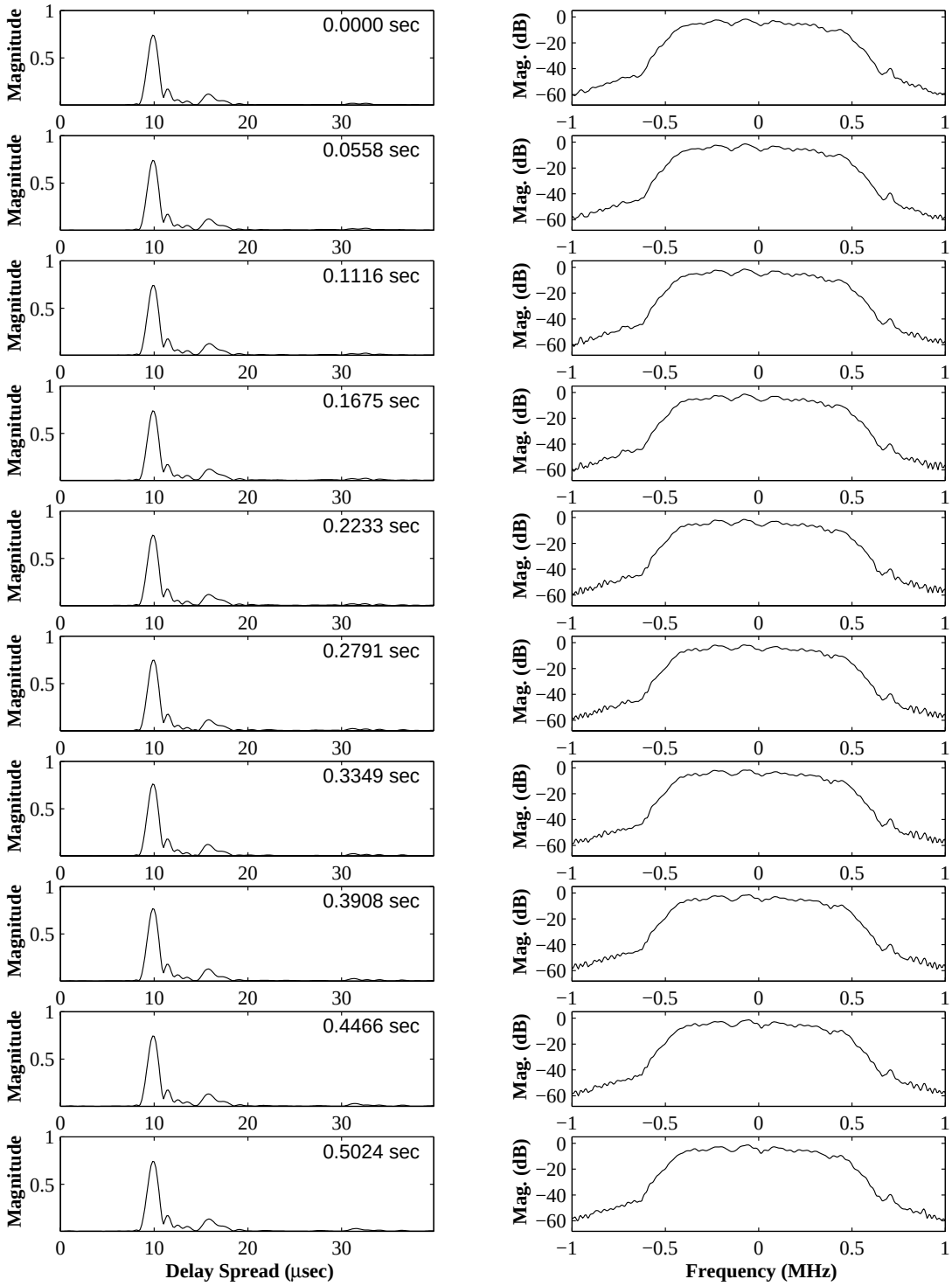

Figure 3.47: Local power delay profiles for ship21jan1607 (1).

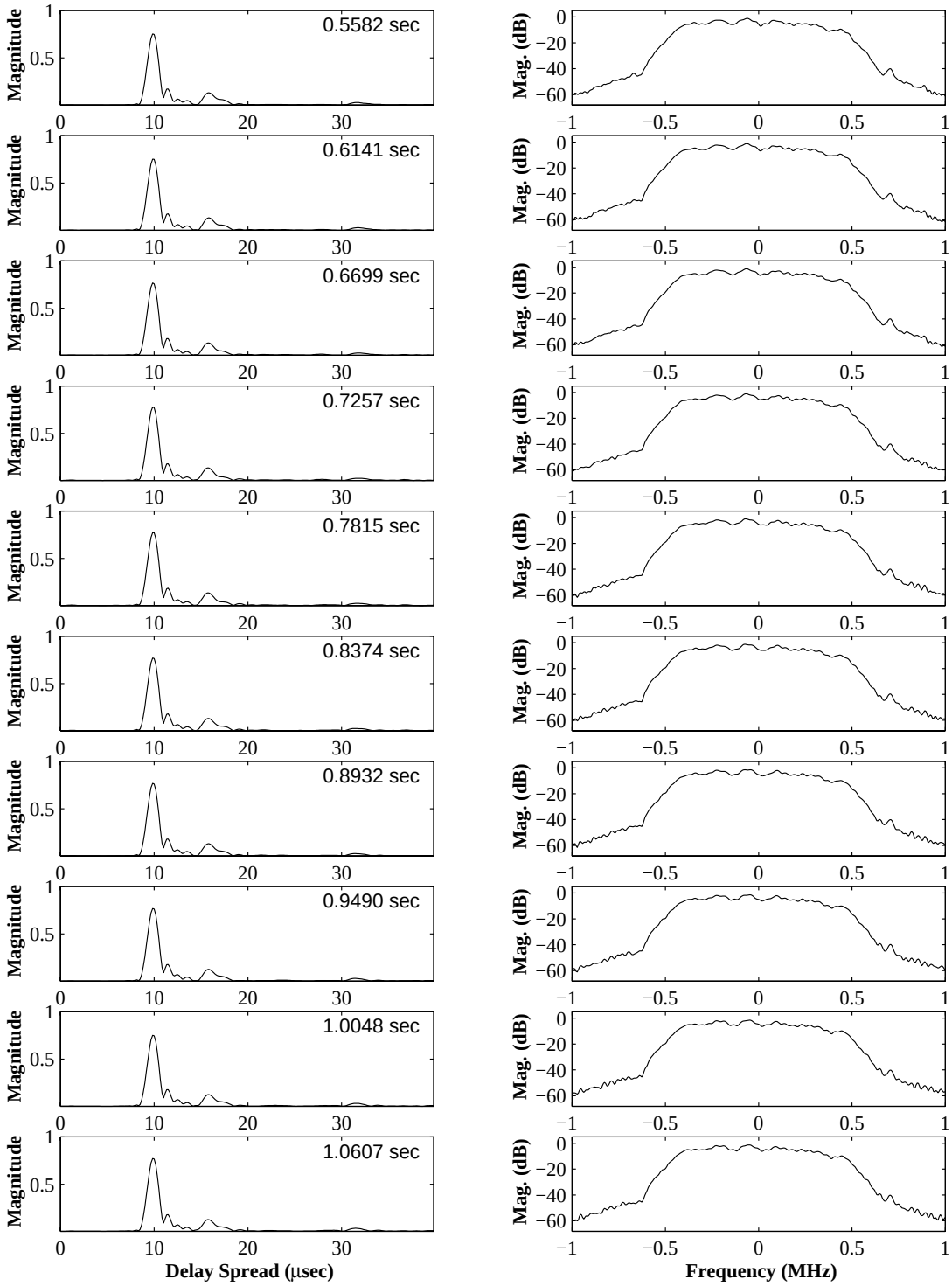

Figure 3.48: Local power delay profiles for ship21jan1607 (2).

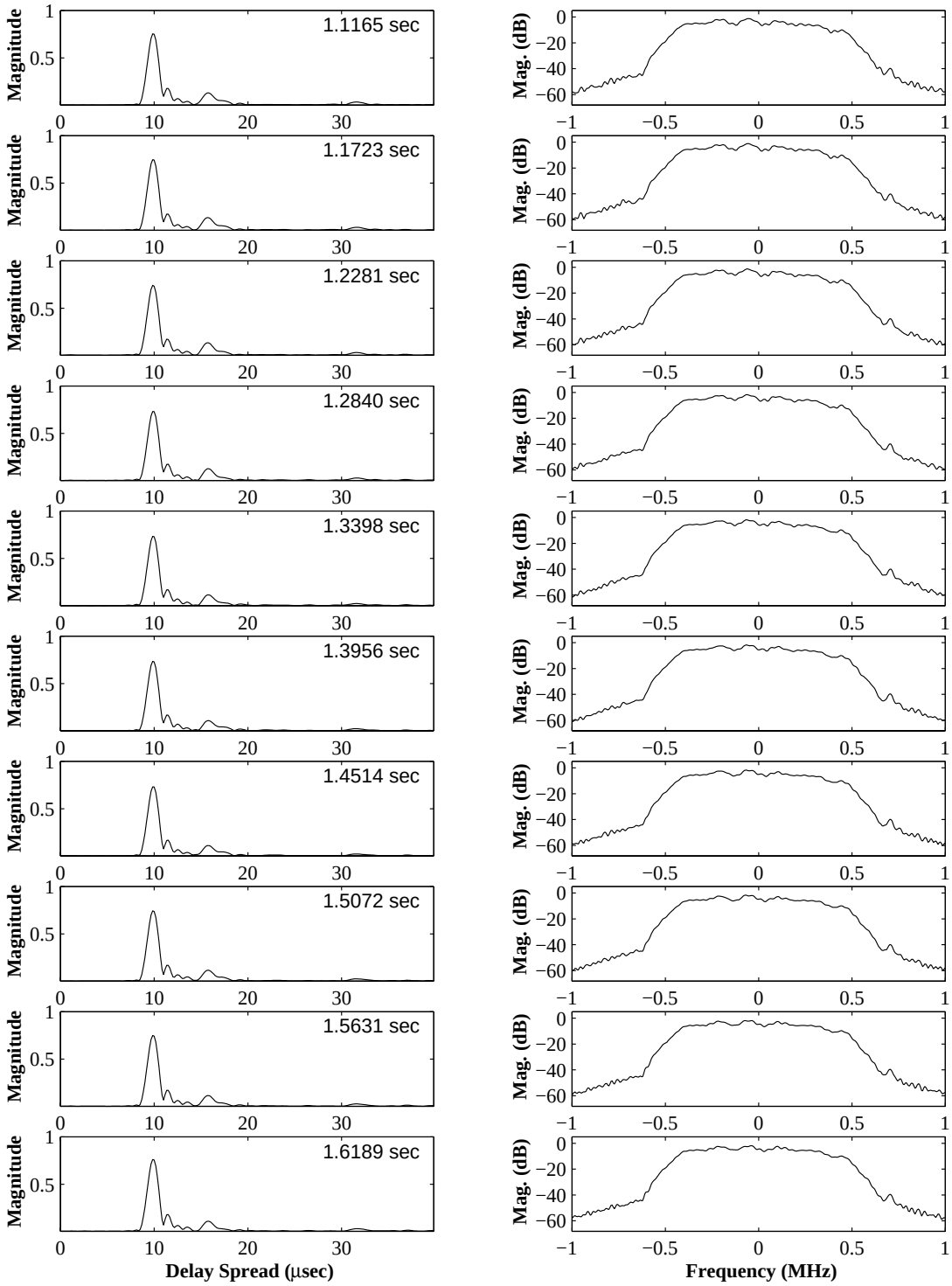

Figure 3.49: Local power delay profiles for ship21jan1607 (3).

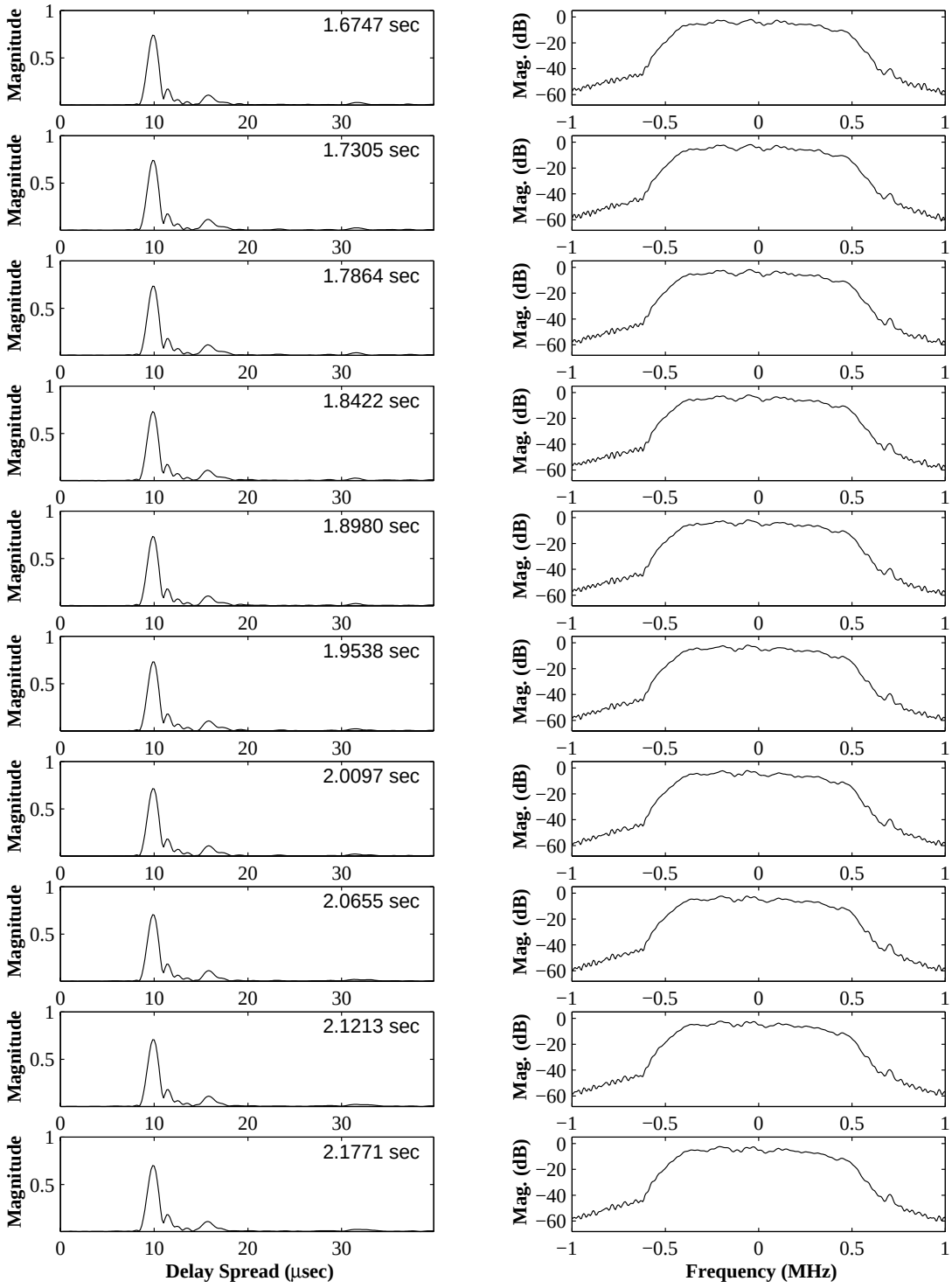

Figure 3.50: Local power delay profiles for ship21jan1607 (4).

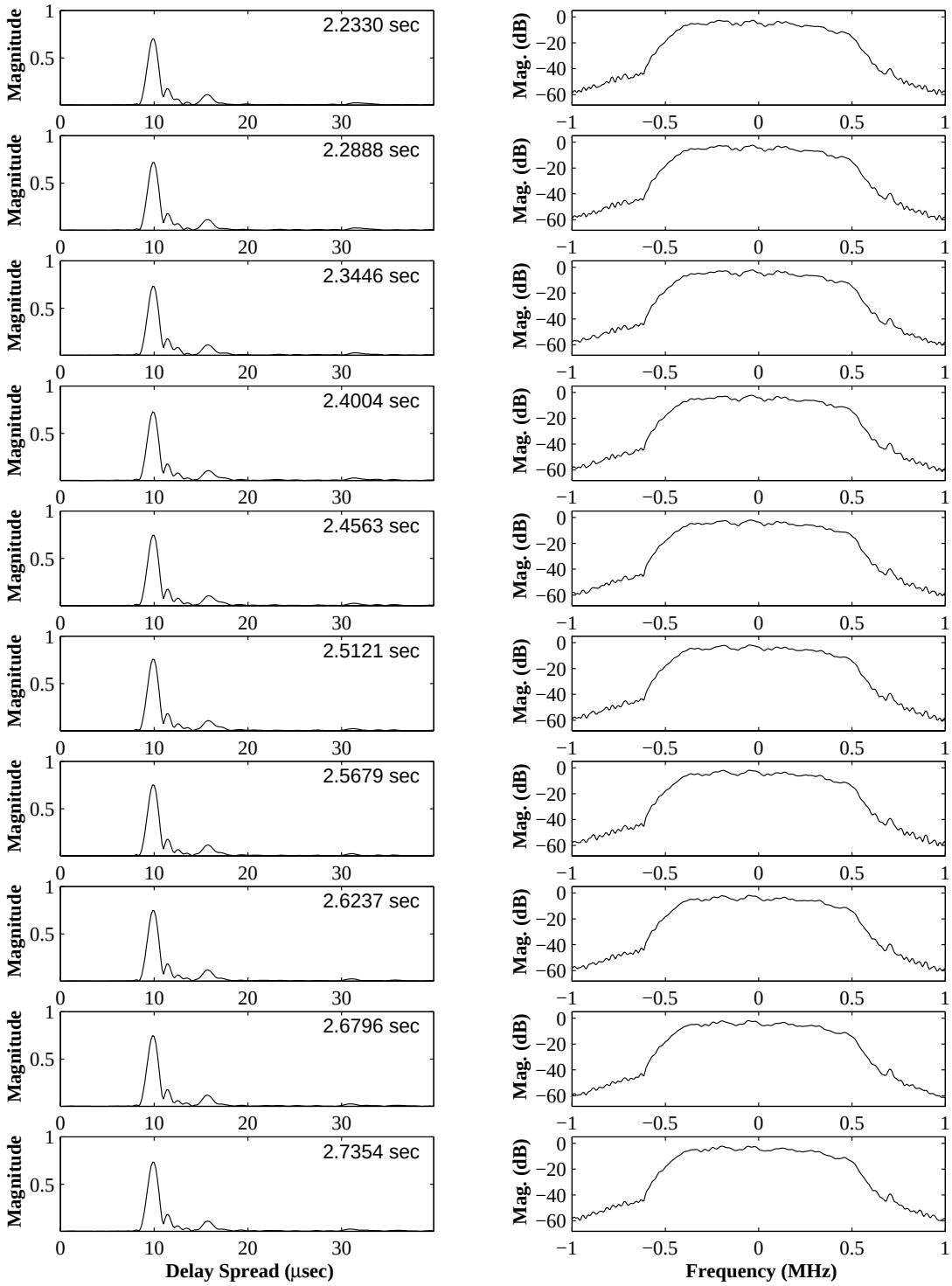

Figure 3.51: Local power delay profiles for ship21jan1607 (5).

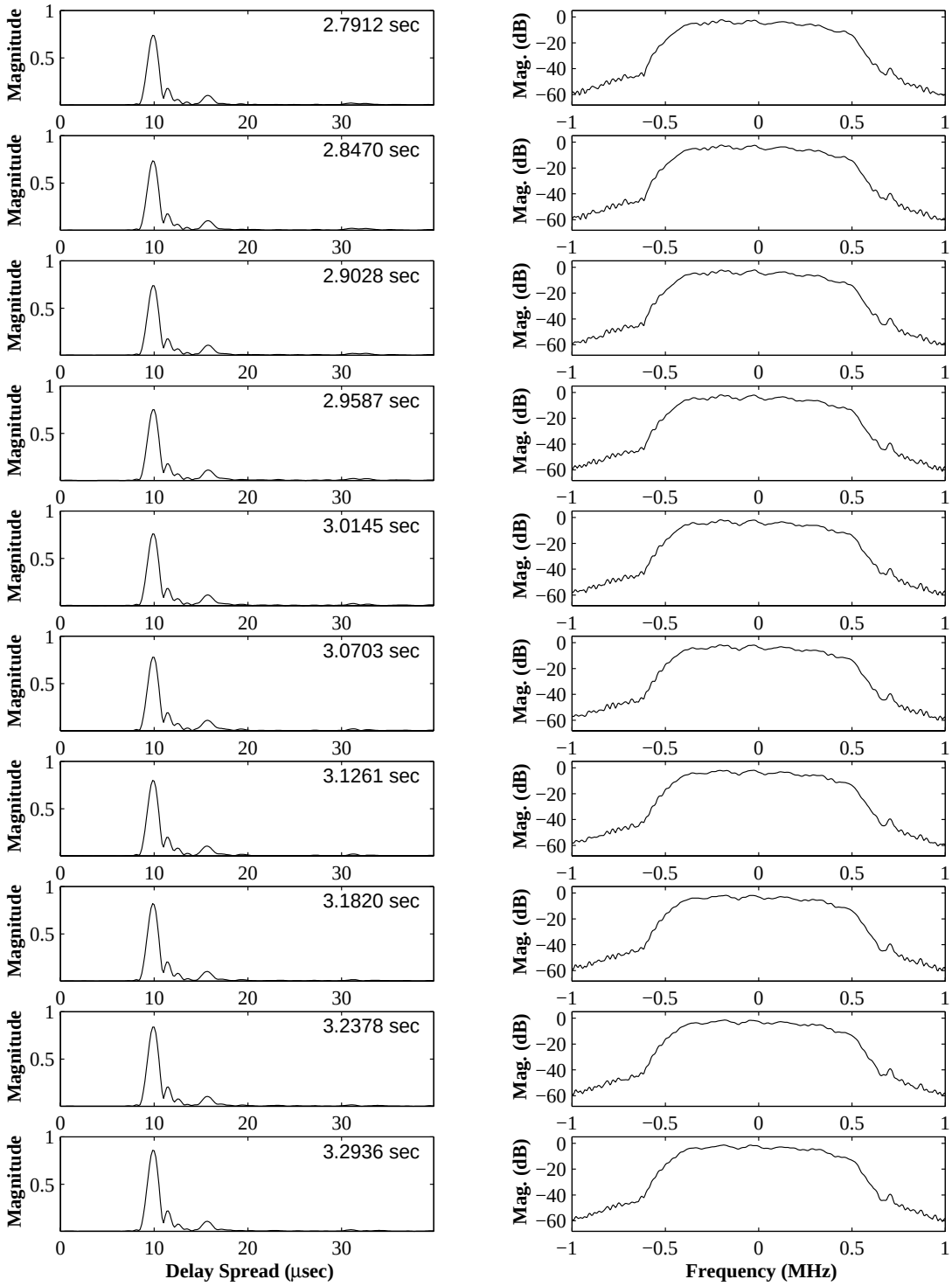

Figure 3.52: Local power delay profiles for ship21jan1607 (6).

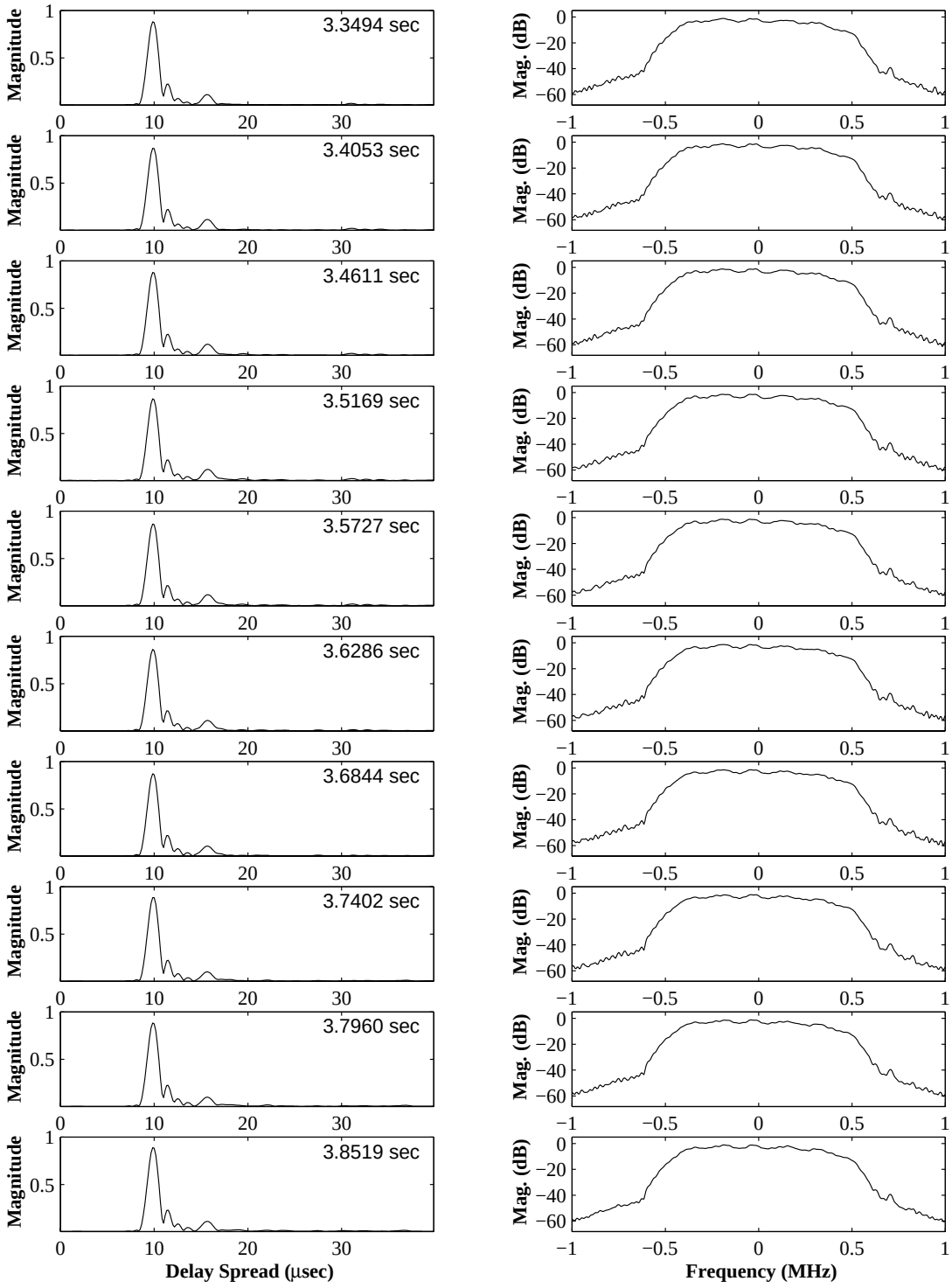

Figure 3.53: Local power delay profiles for ship21jan1607 (7).

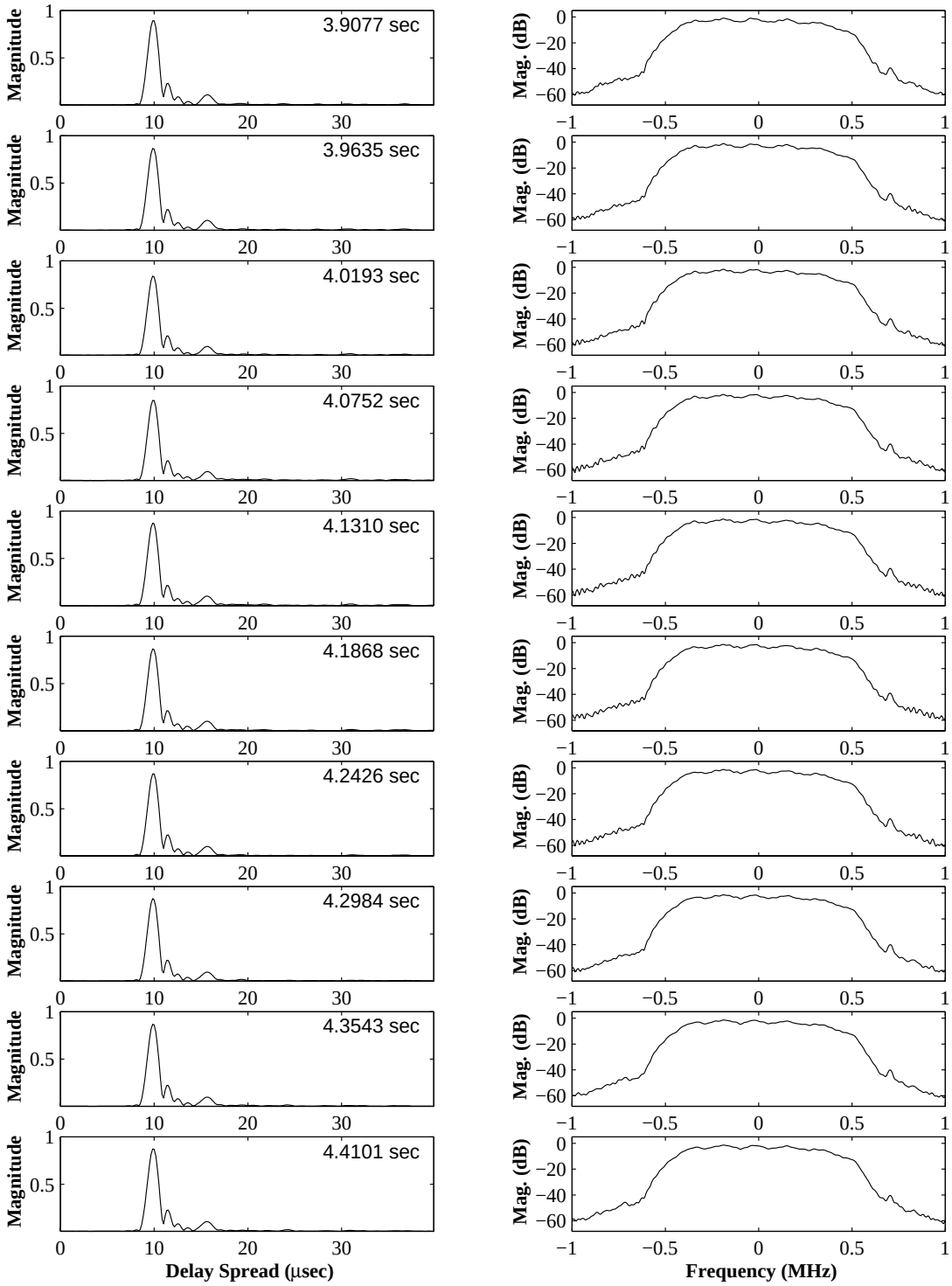

Figure 3.54: Local power delay profiles for ship21jan1607 (8).

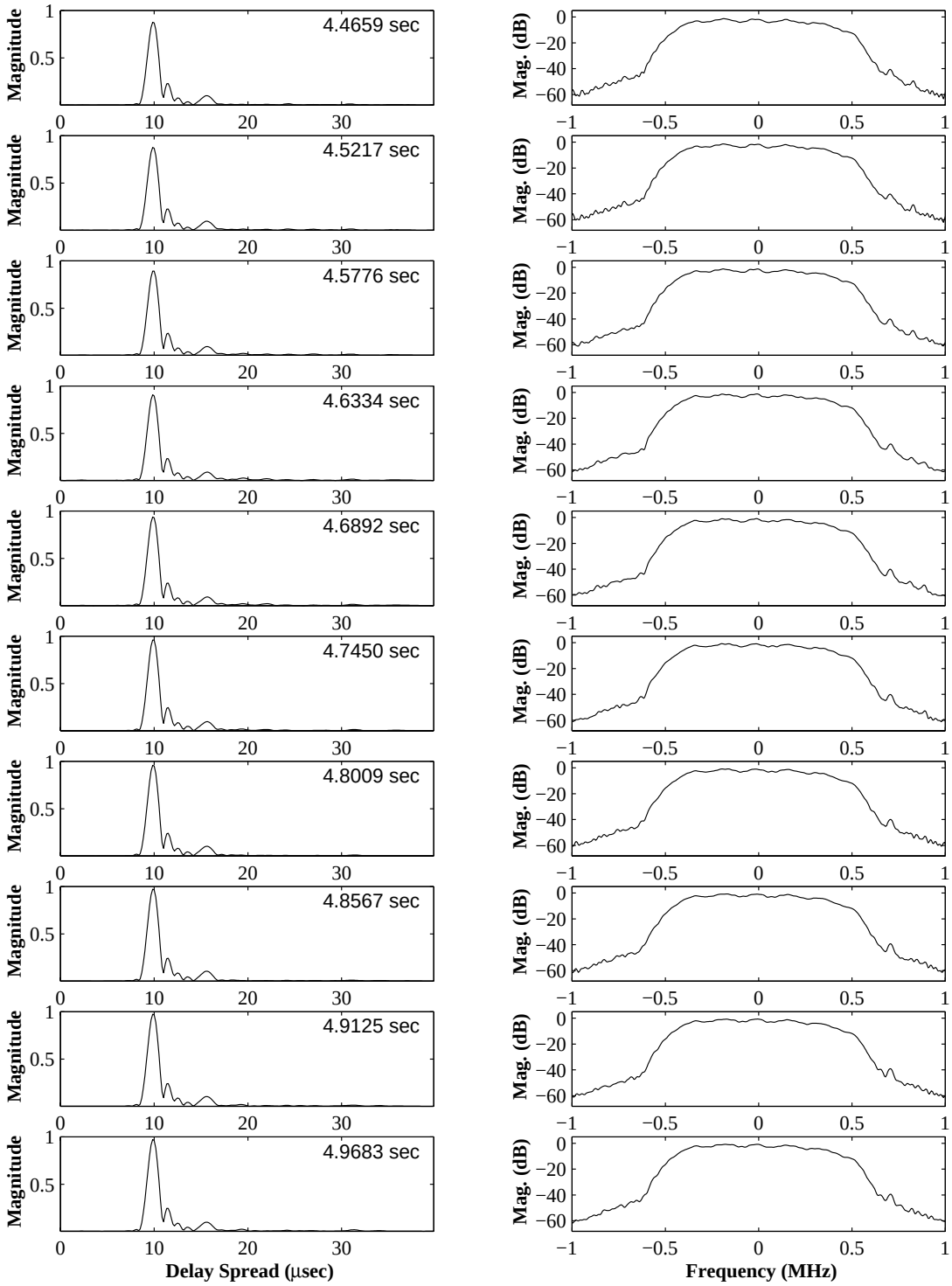

Figure 3.55: Local power delay profiles for ship21jan1607 (9).

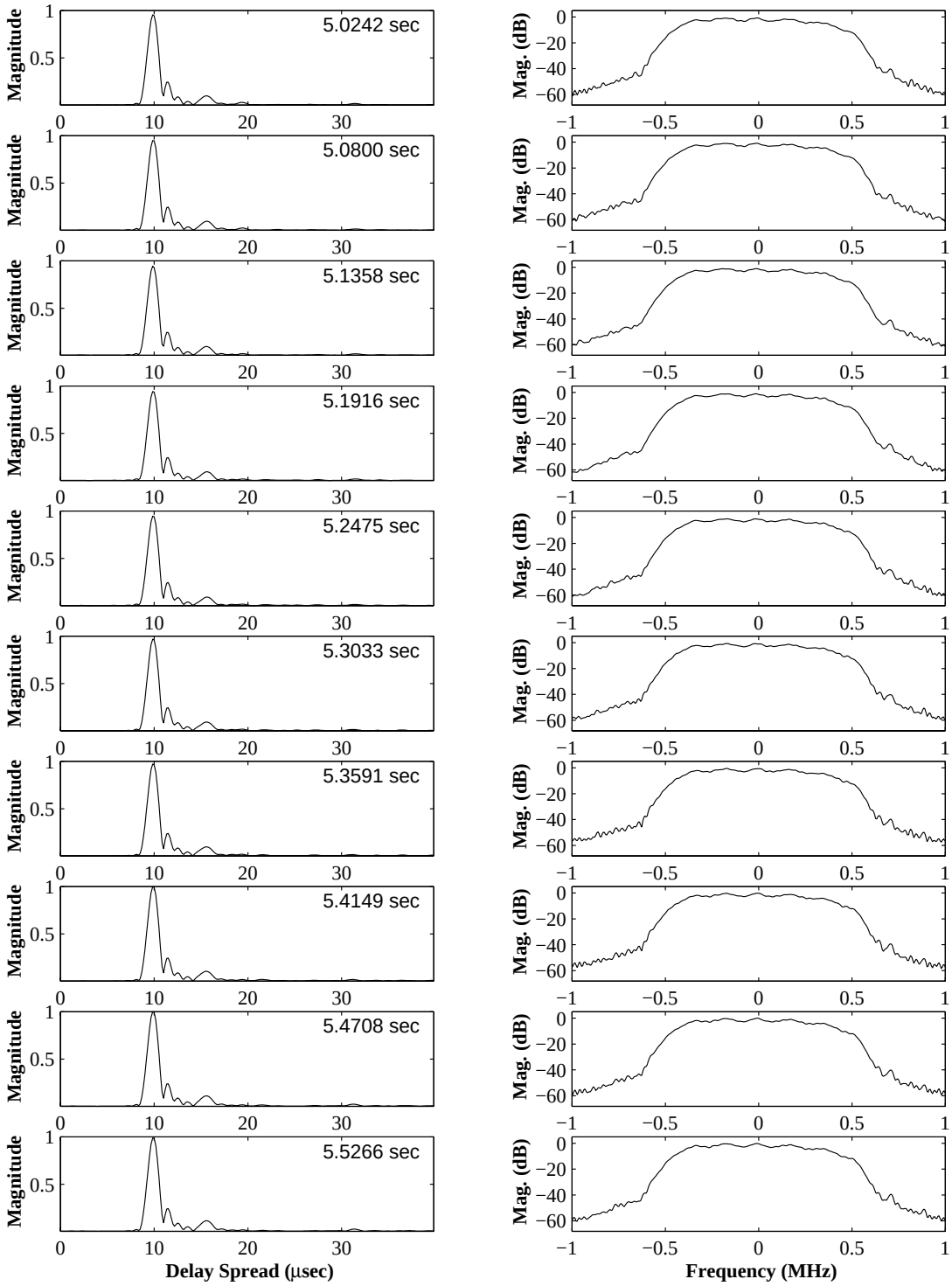

Figure 3.56: Local power delay profiles for ship21jan1607 (10).

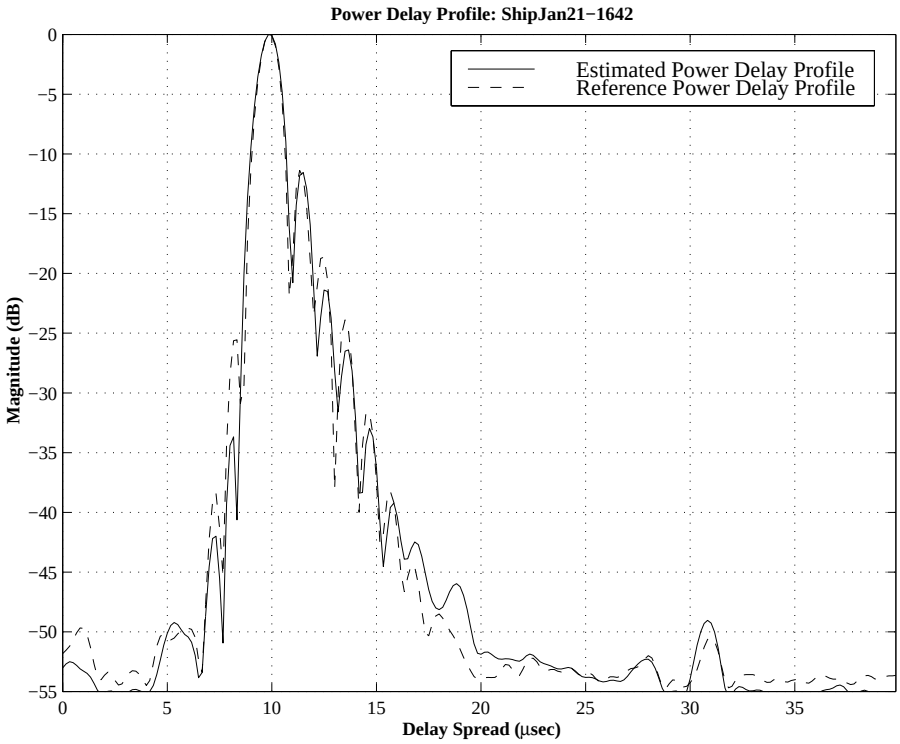

Figure 3.57: Power delay profile for ship21jan1642.

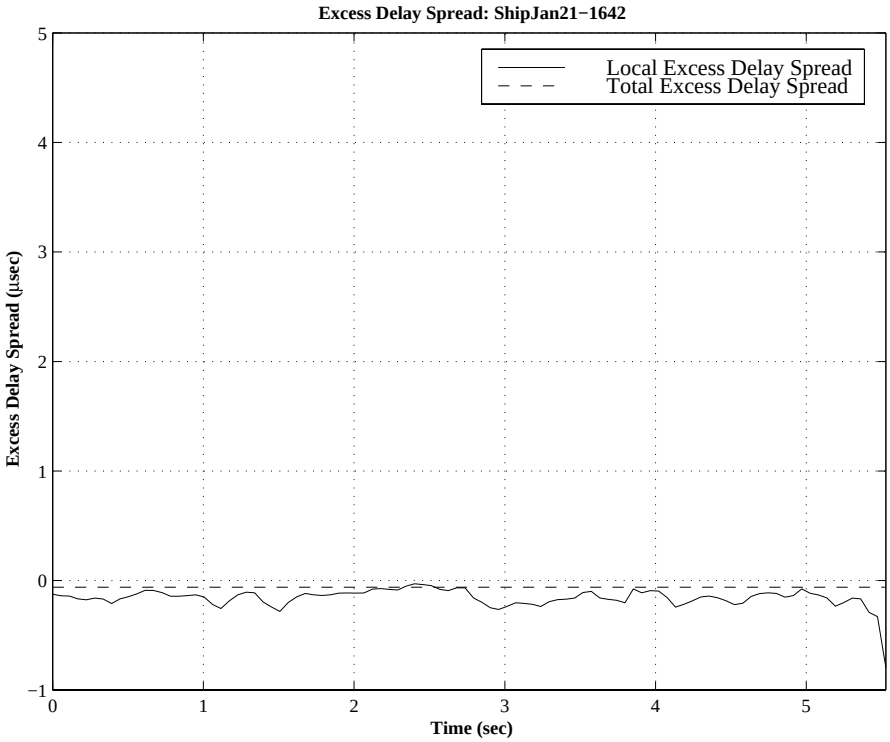

Figure 3.58: Excess delay spread for ship21jan1642.

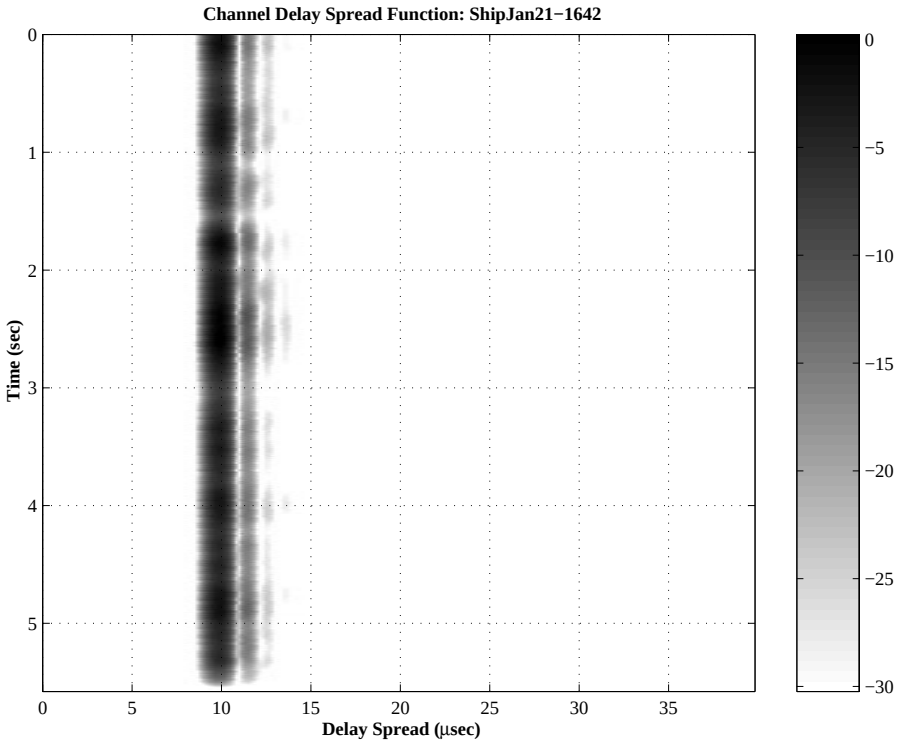

Figure 3.59: Channel delay spread function for ship21jan1642.

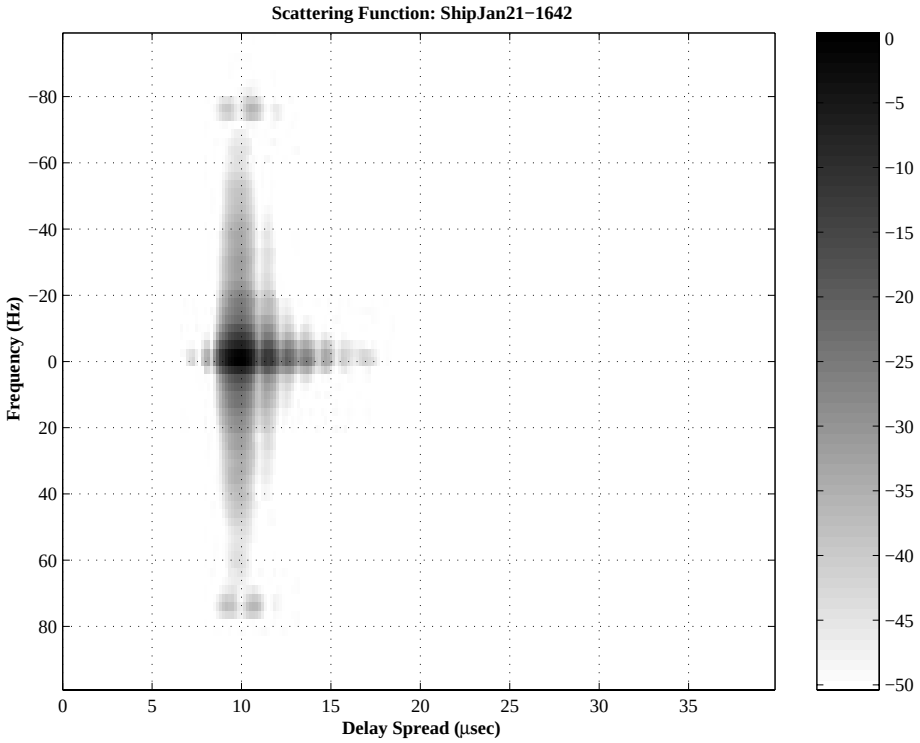

Figure 3.60: Scattering function for ship21jan1642.

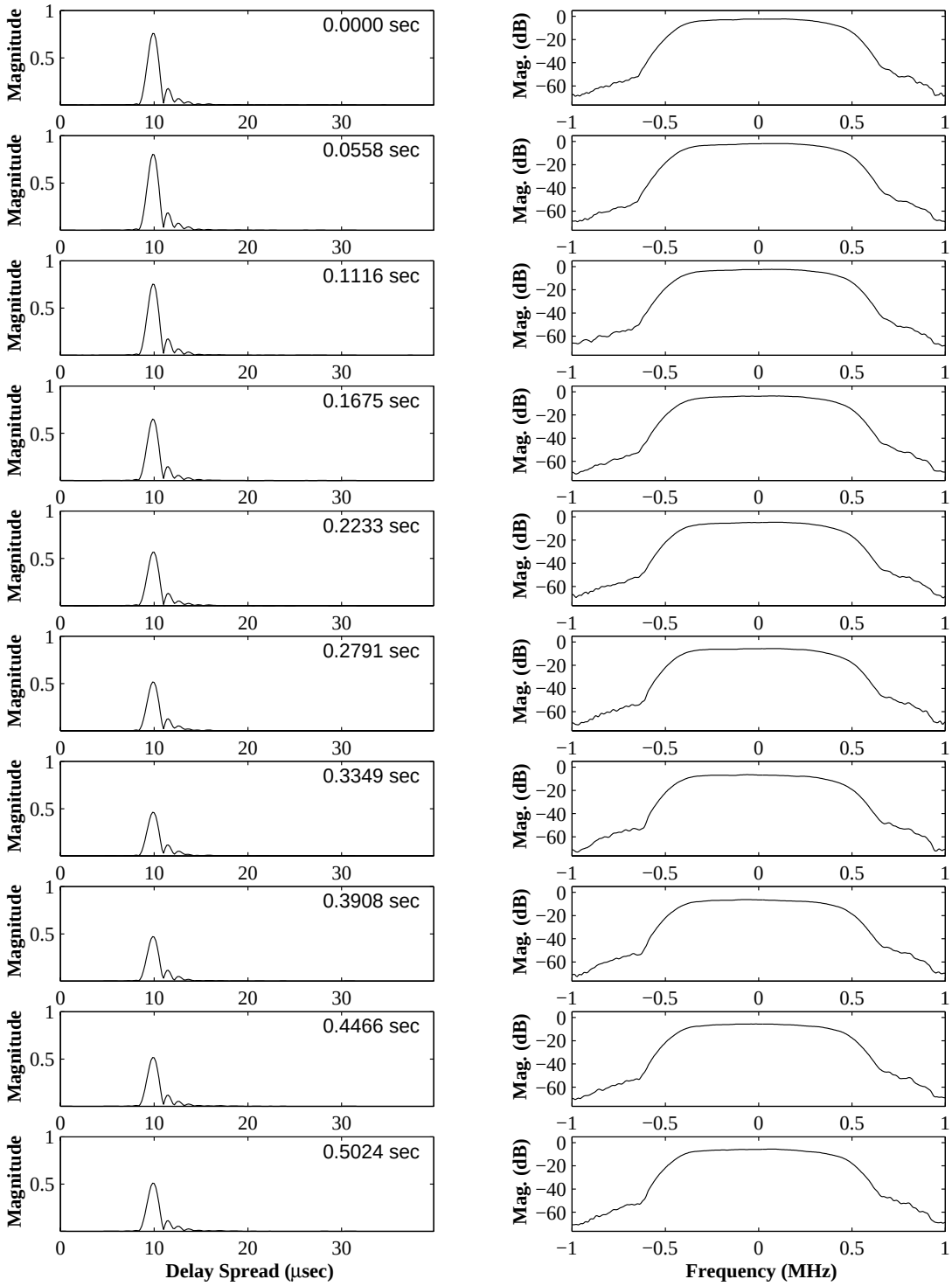

Figure 3.61: Local power delay profiles for ship21jan1642 (1).

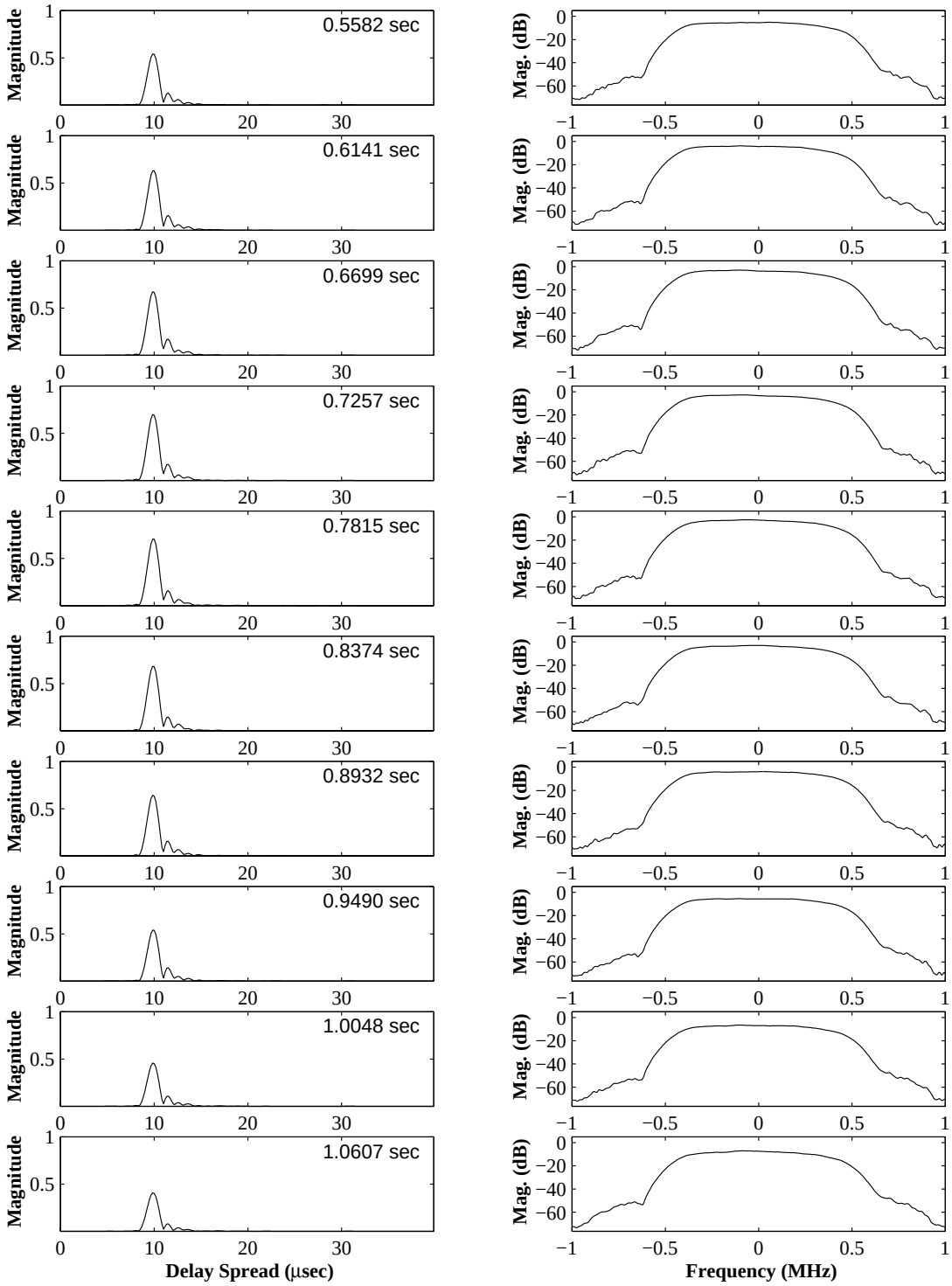

Figure 3.62: Local power delay profiles for ship21jan1642 (2).

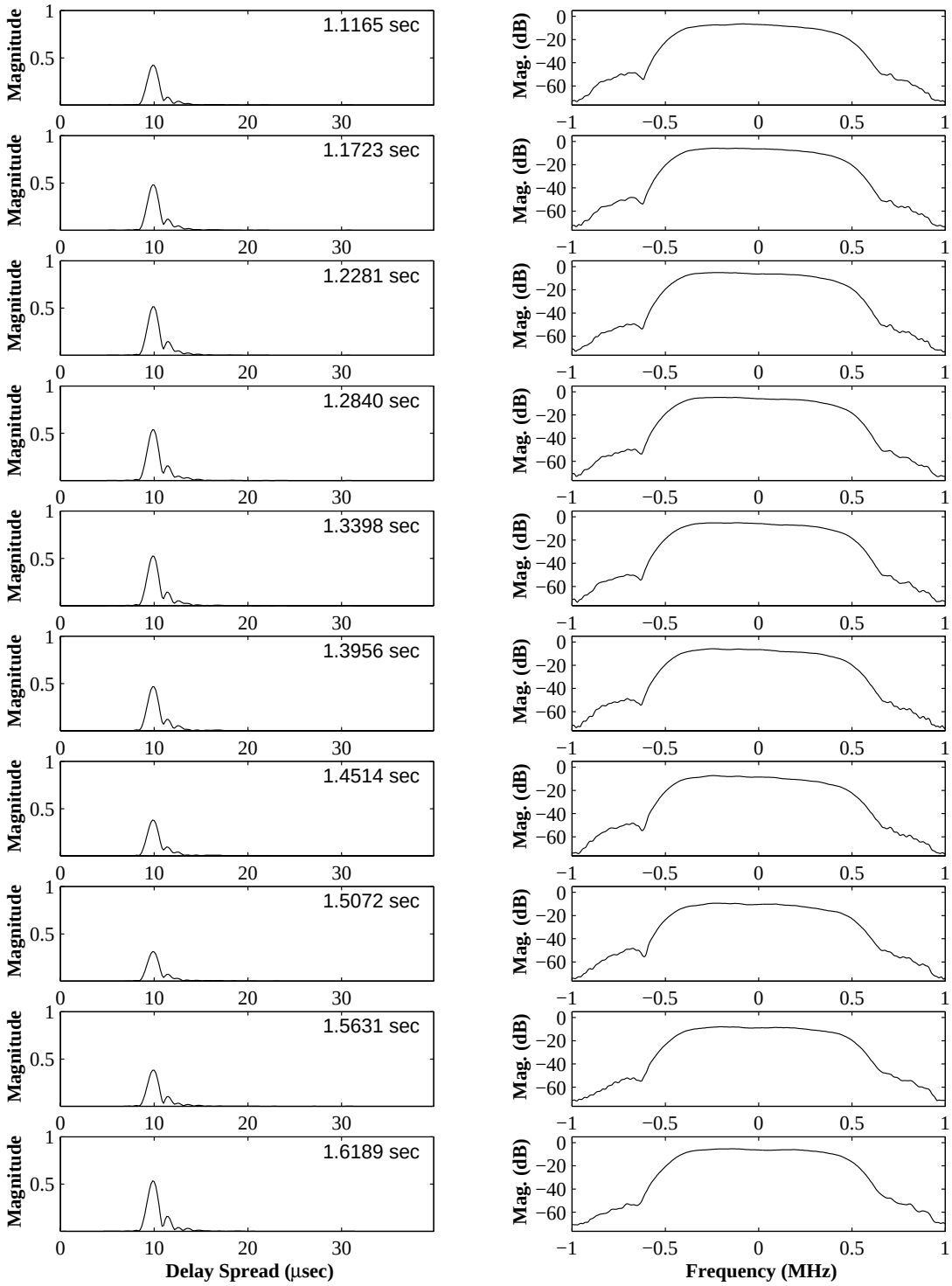

Figure 3.63: Local power delay profiles for ship21jan1642 (3).

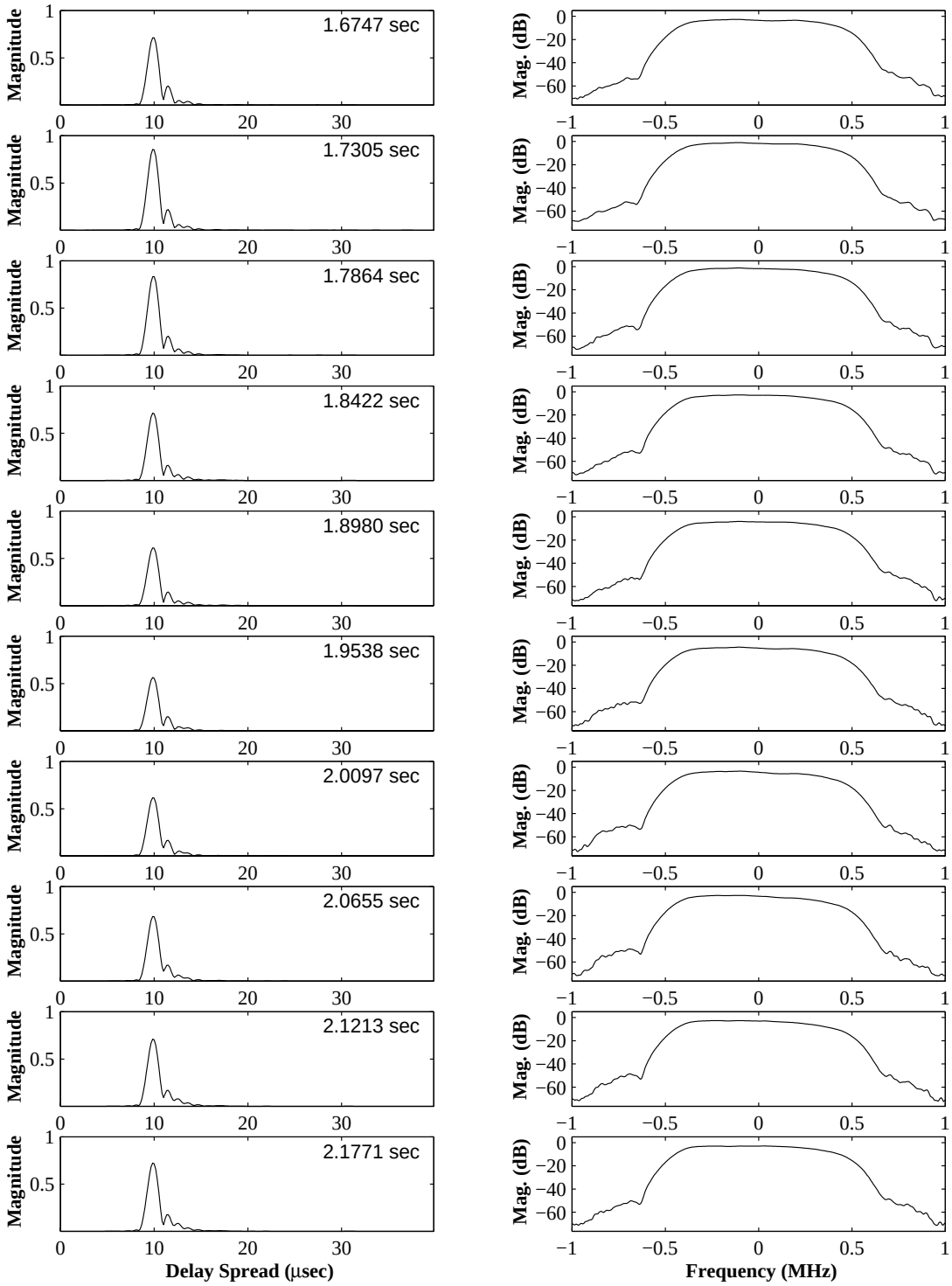

Figure 3.64: Local power delay profiles for ship21jan1642 (4).

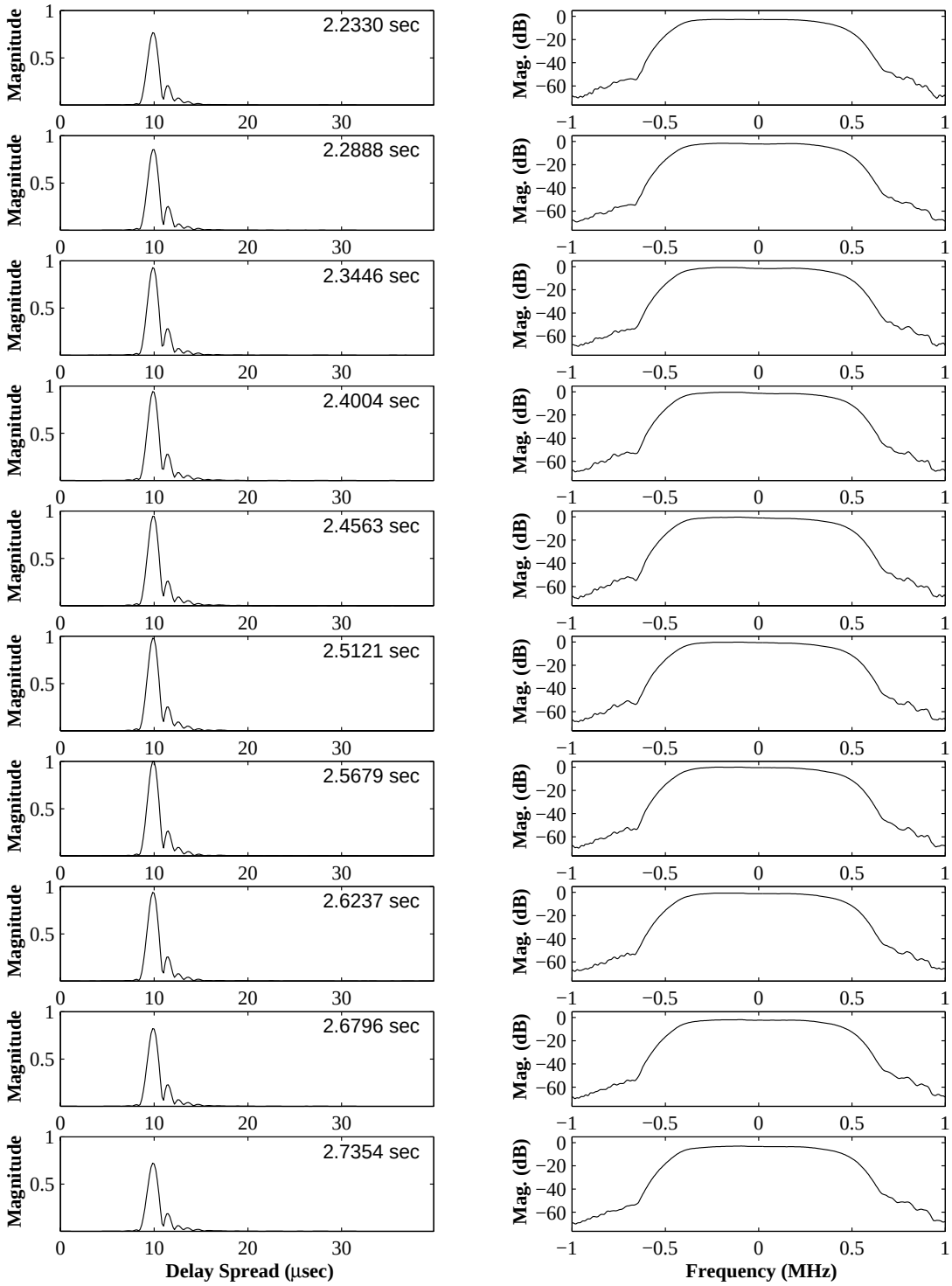

Figure 3.65: Local power delay profiles for ship21jan1642 (5).

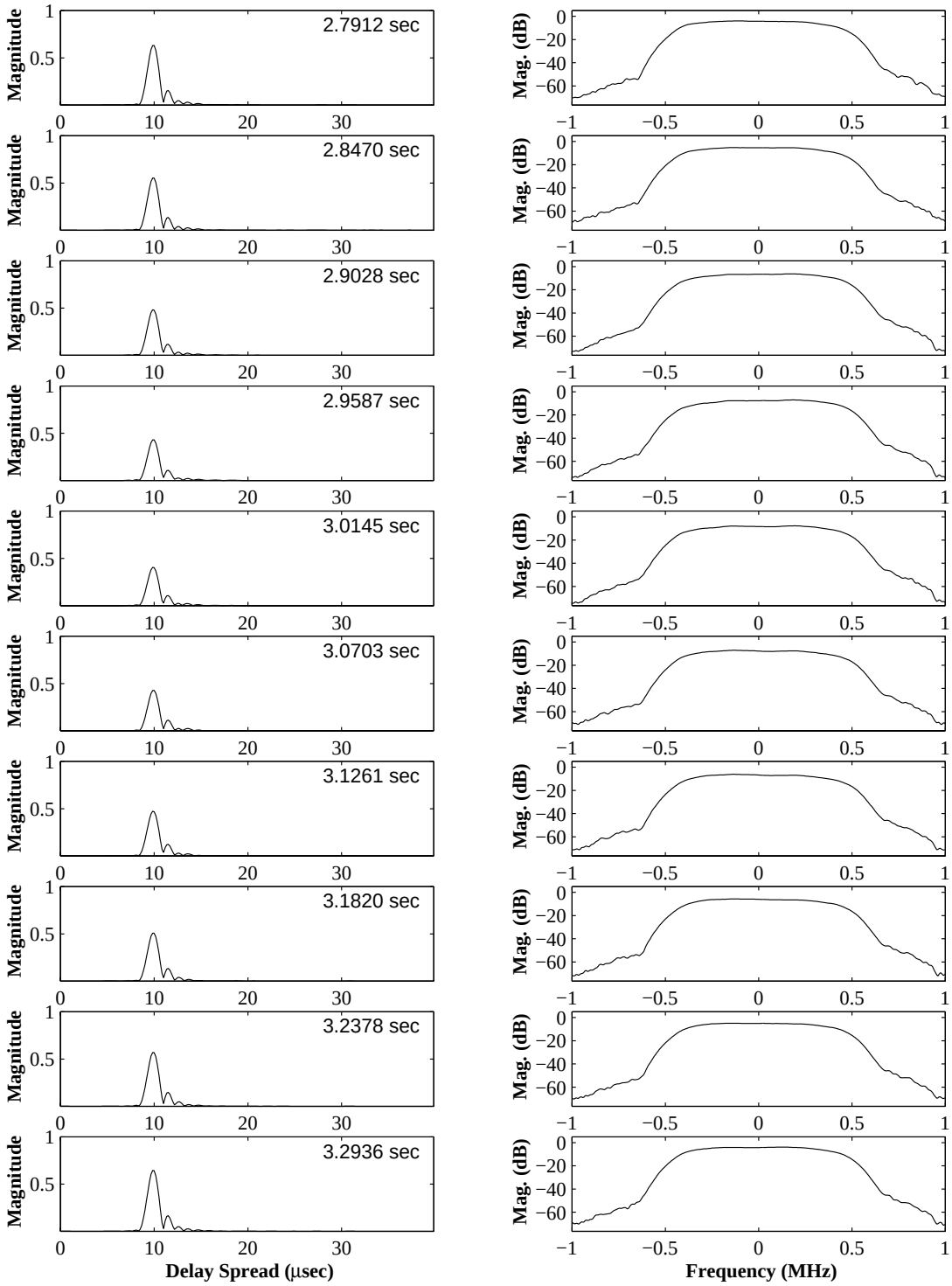

Figure 3.66: Local power delay profiles for ship21jan1642 (6).

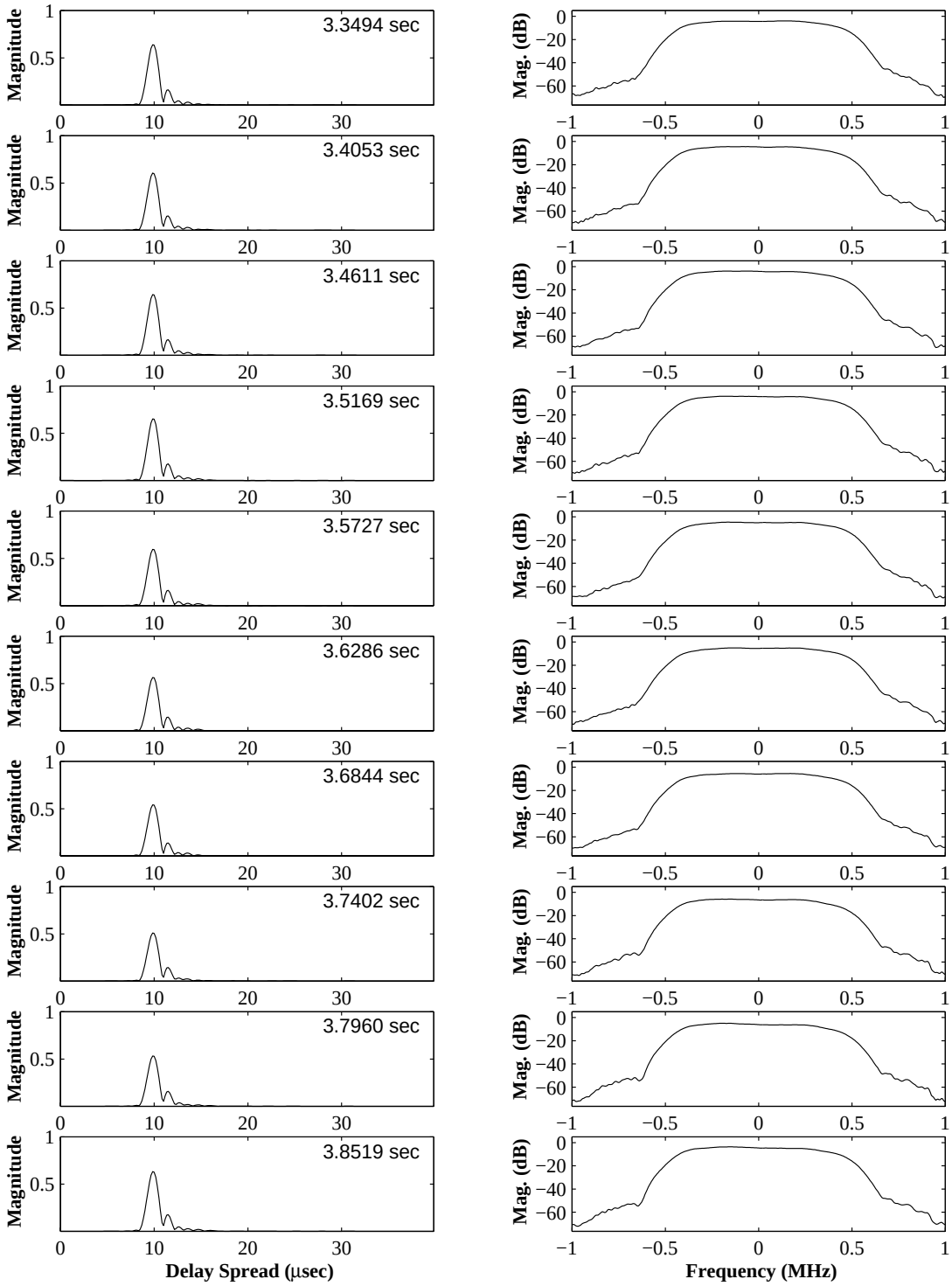

Figure 3.67: Local power delay profiles for ship21jan1642 (7).

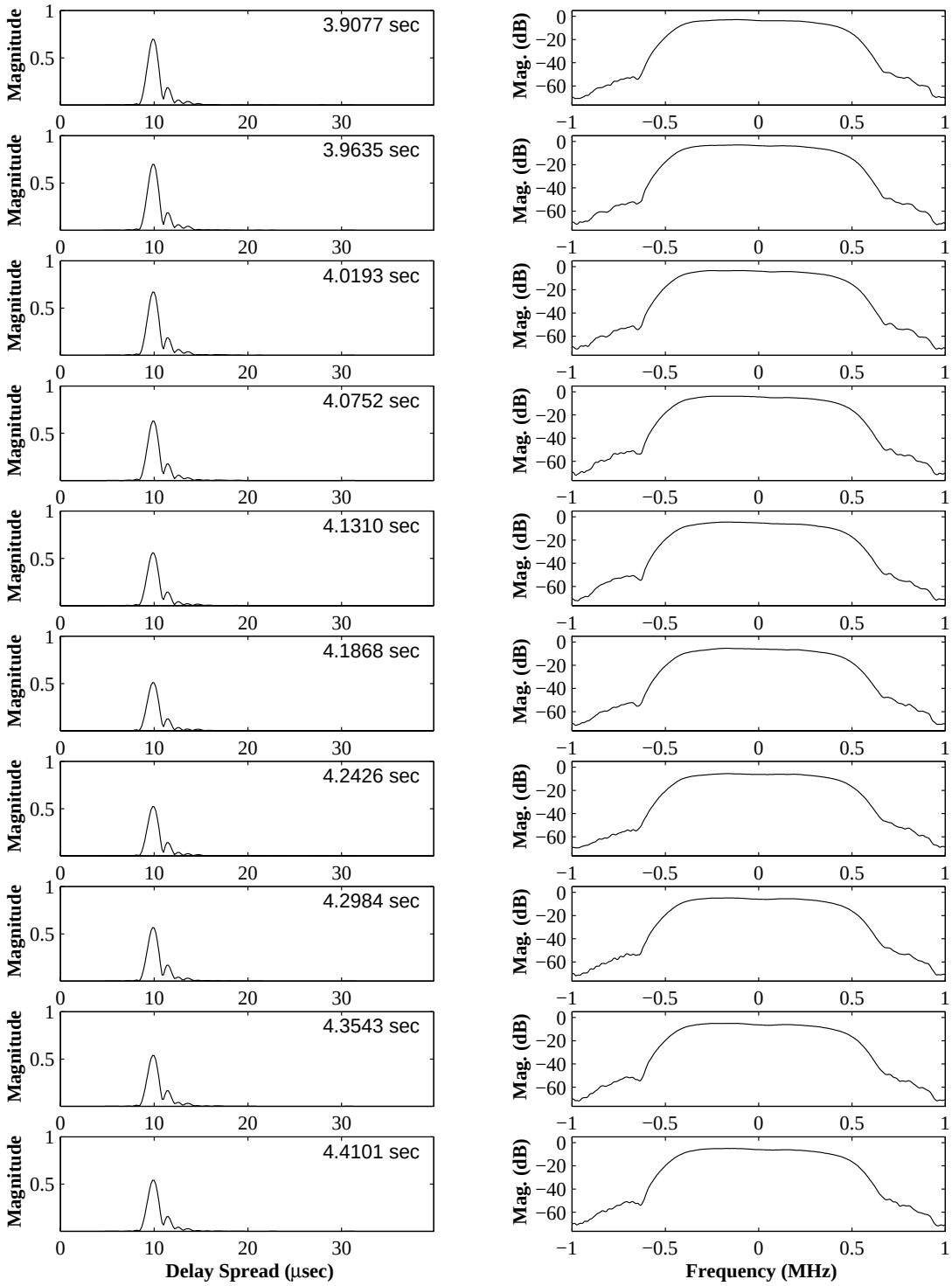

Figure 3.68: Local power delay profiles for ship21jan1642 (8).

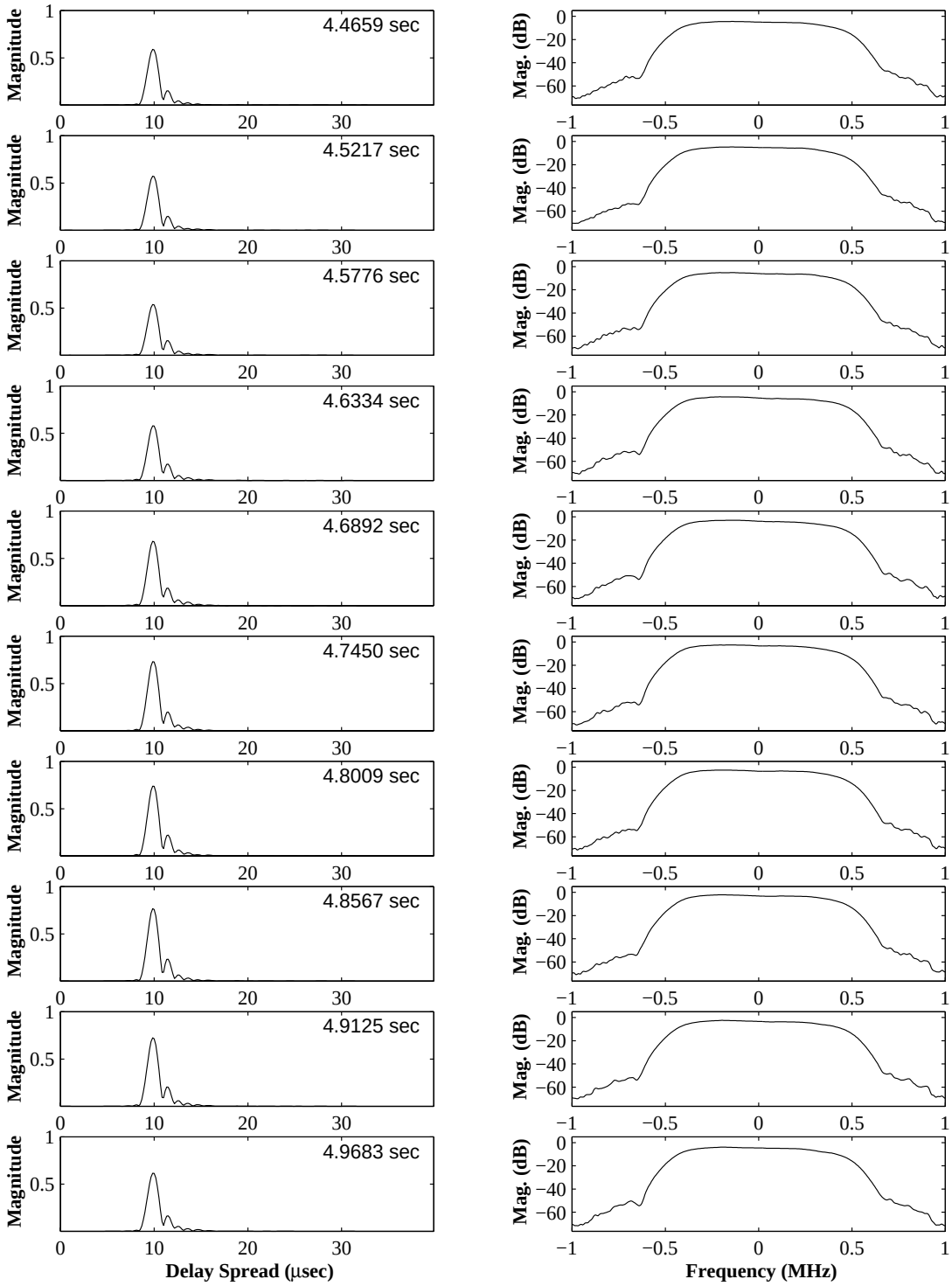

Figure 3.69: Local power delay profiles for ship21jan1642 (9).

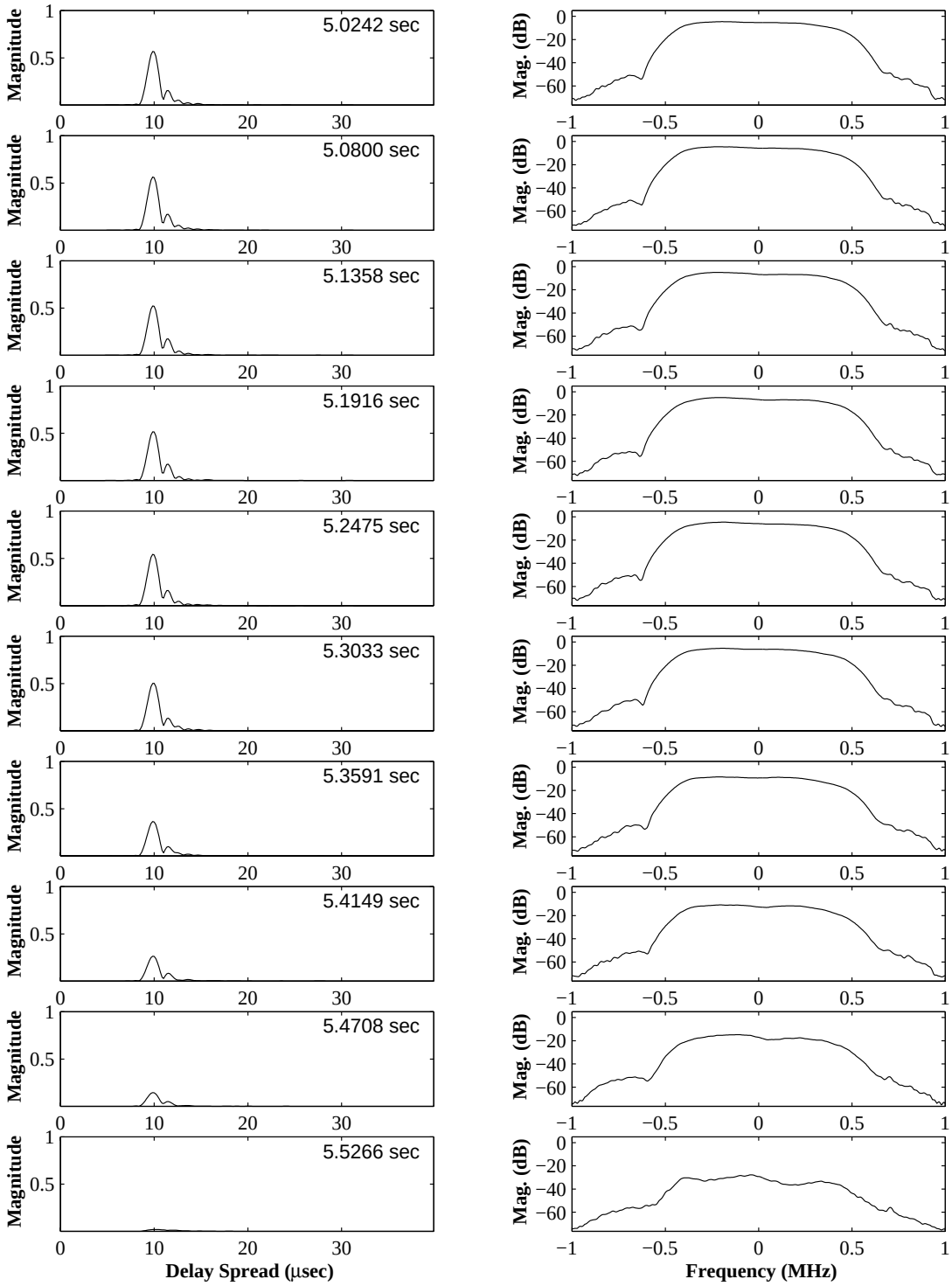

Figure 3.70: Local power delay profiles for ship21jan1642 (10).

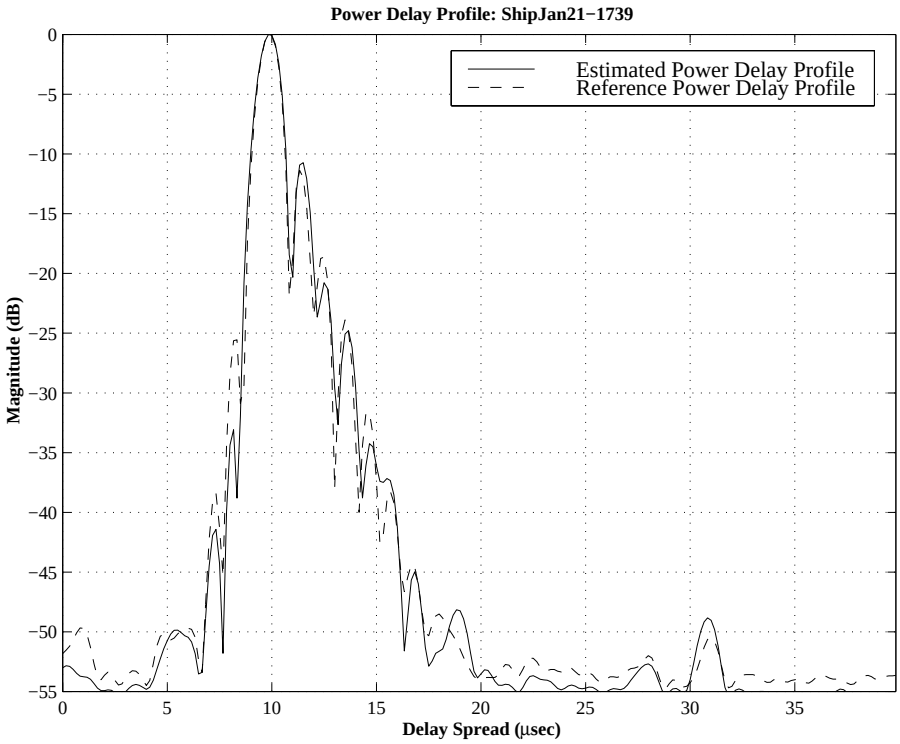

Figure 3.71: Power delay profile for ship21jan1739.

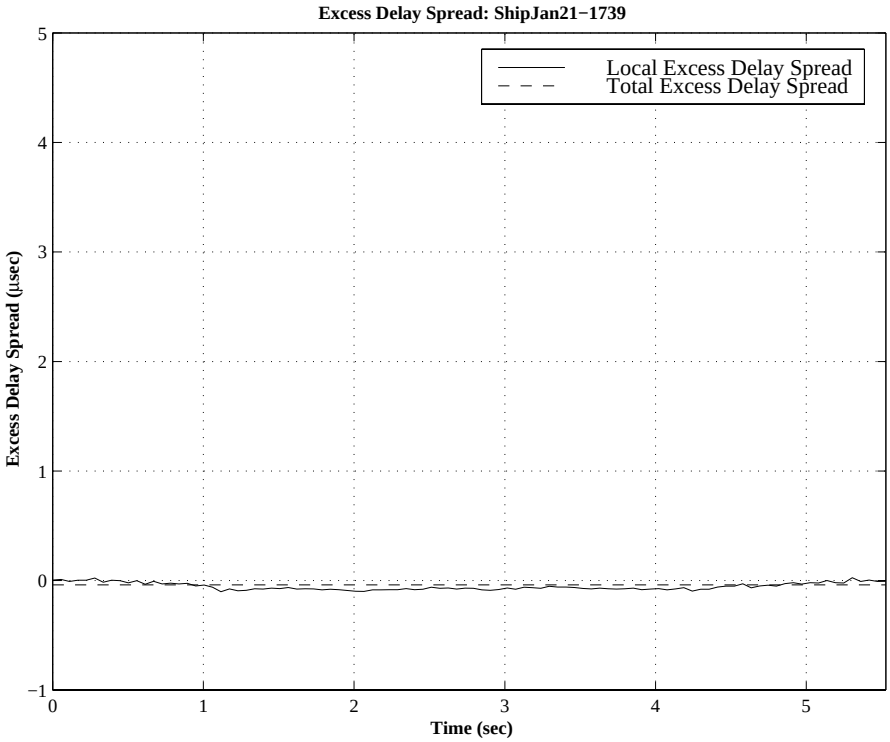

Figure 3.72: Excess delay spread for ship21jan1739.

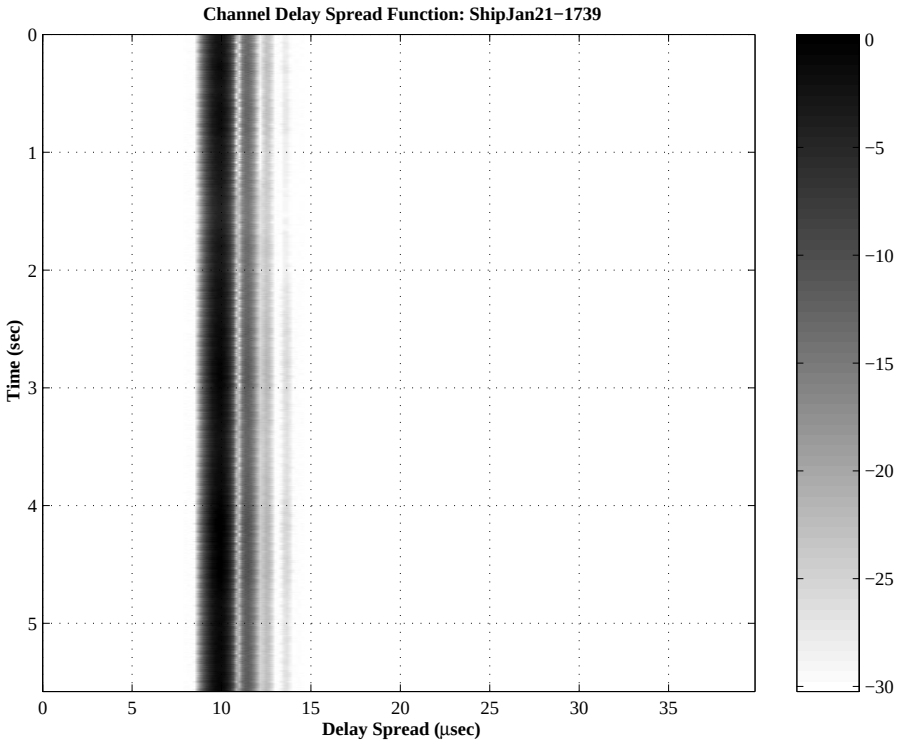

Figure 3.73: Channel delay spread function for ship21jan1739.

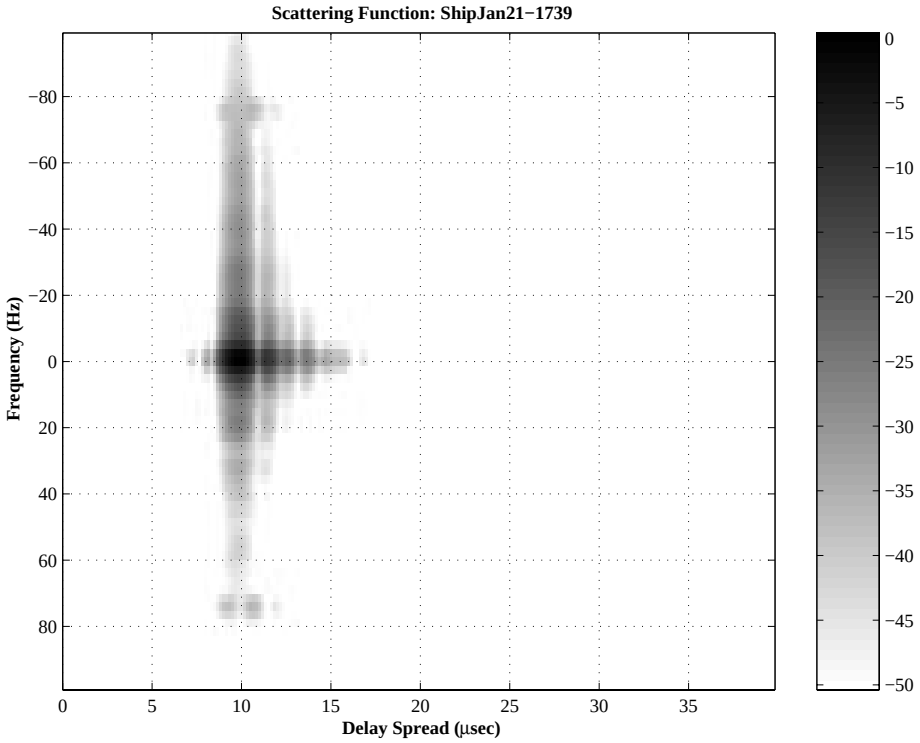

Figure 3.74: Scattering function for ship21jan1739.

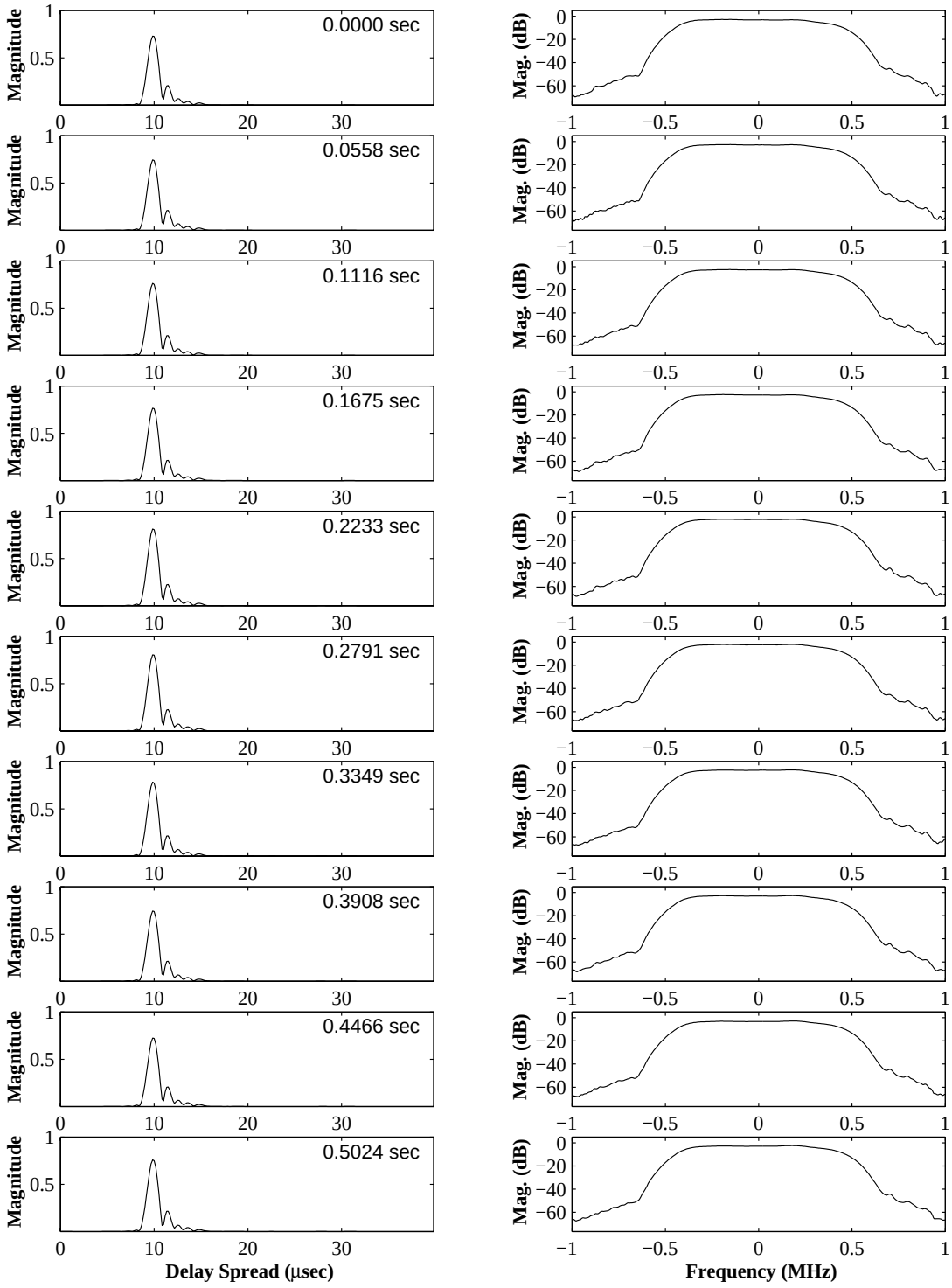

Figure 3.75: Local power delay profiles for ship21jan1739 (1).

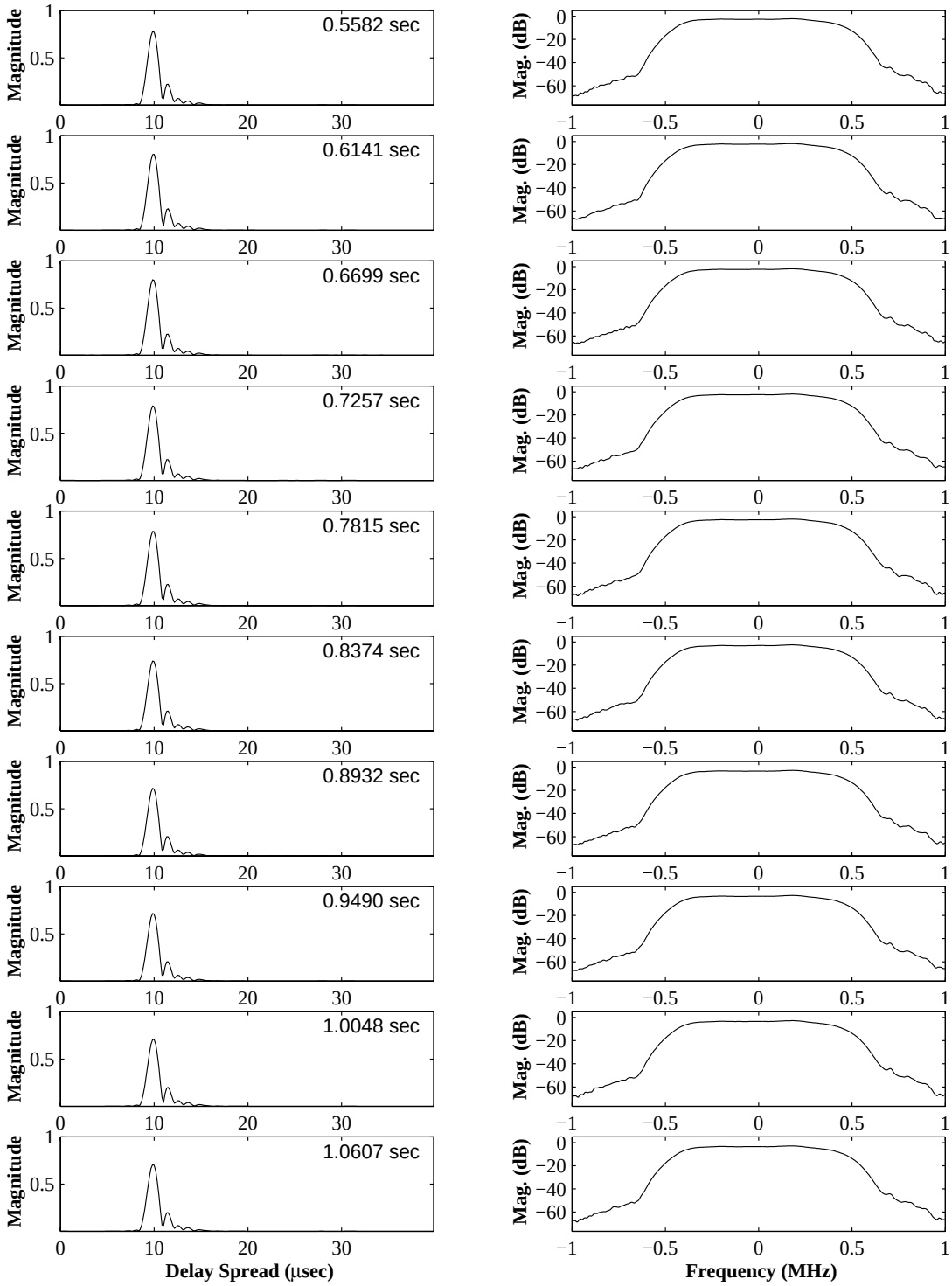

Figure 3.76: Local power delay profiles for ship21jan1739 (2).

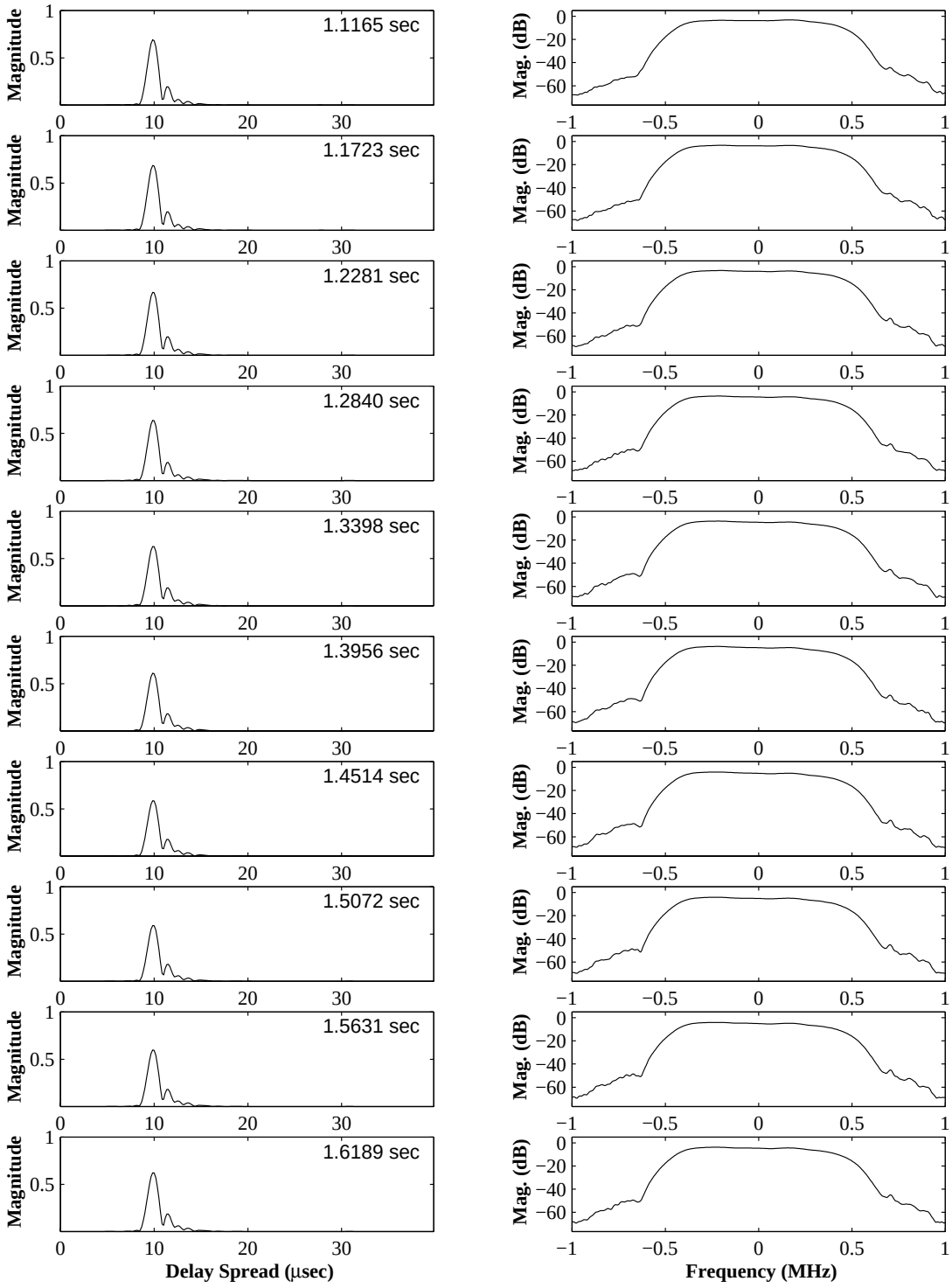

Figure 3.77: Local power delay profiles for ship21jan1739 (3).

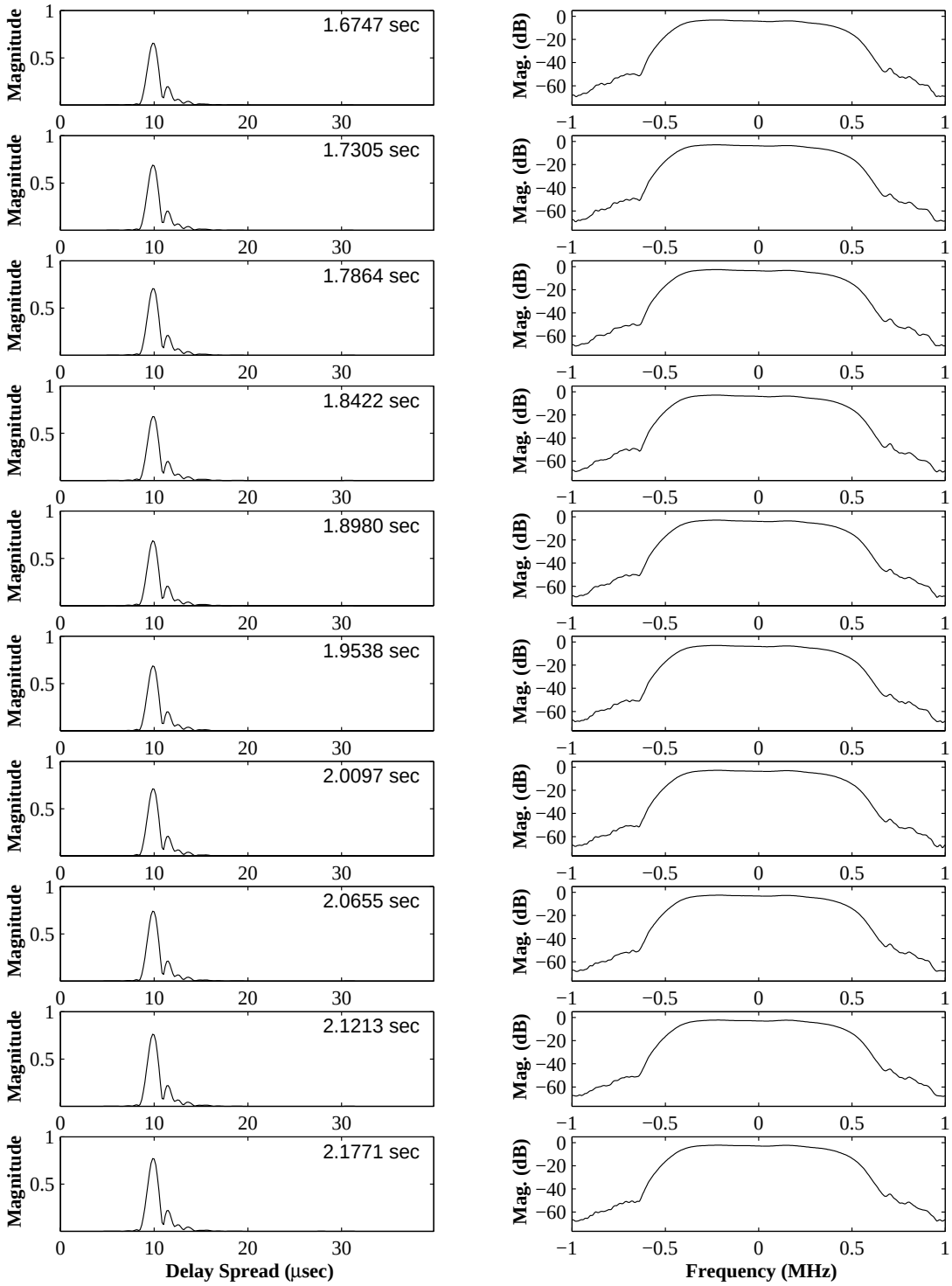

Figure 3.78: Local power delay profiles for ship21jan1739 (4).

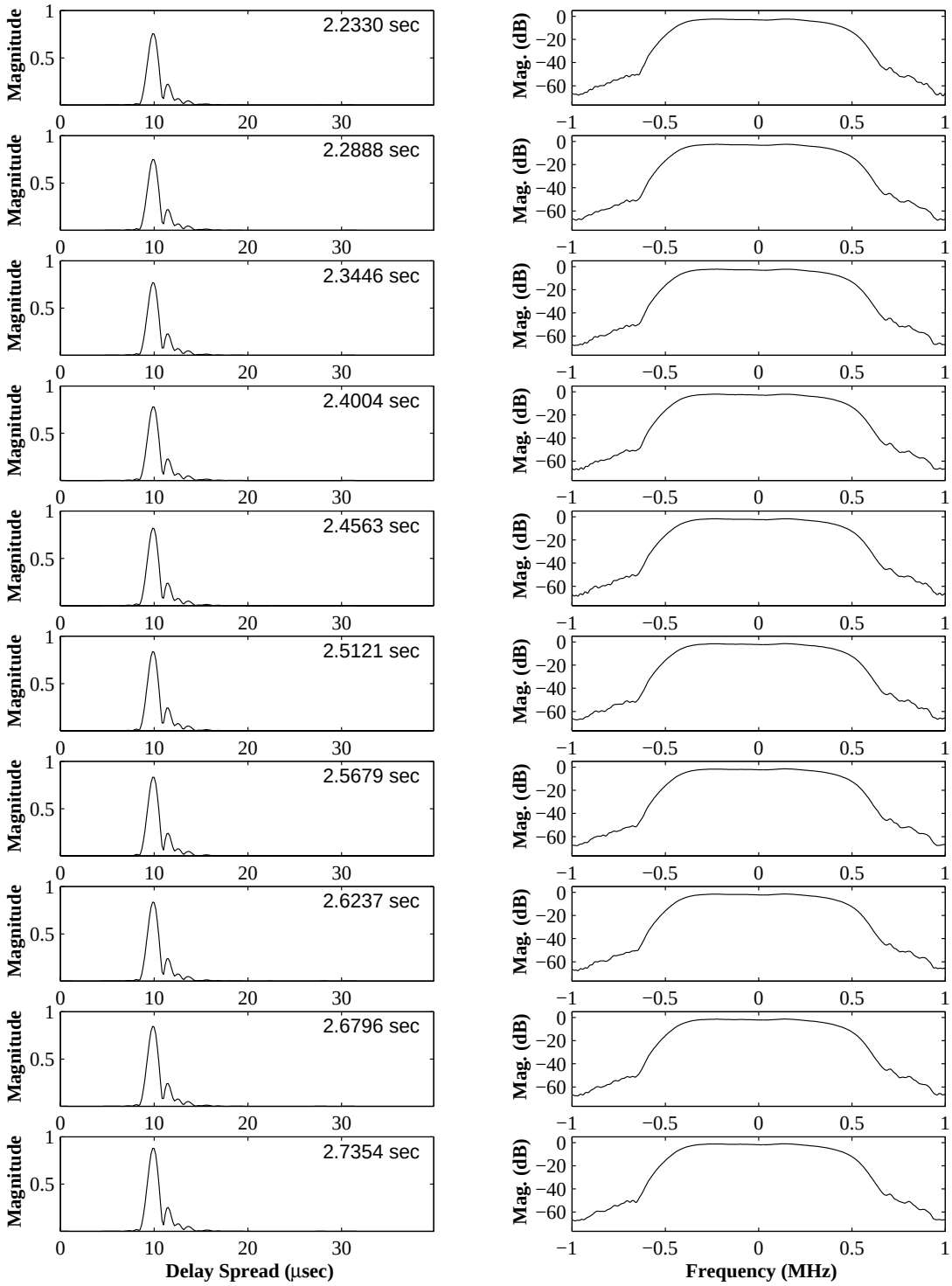

Figure 3.79: Local power delay profiles for ship21jan1739 (5).

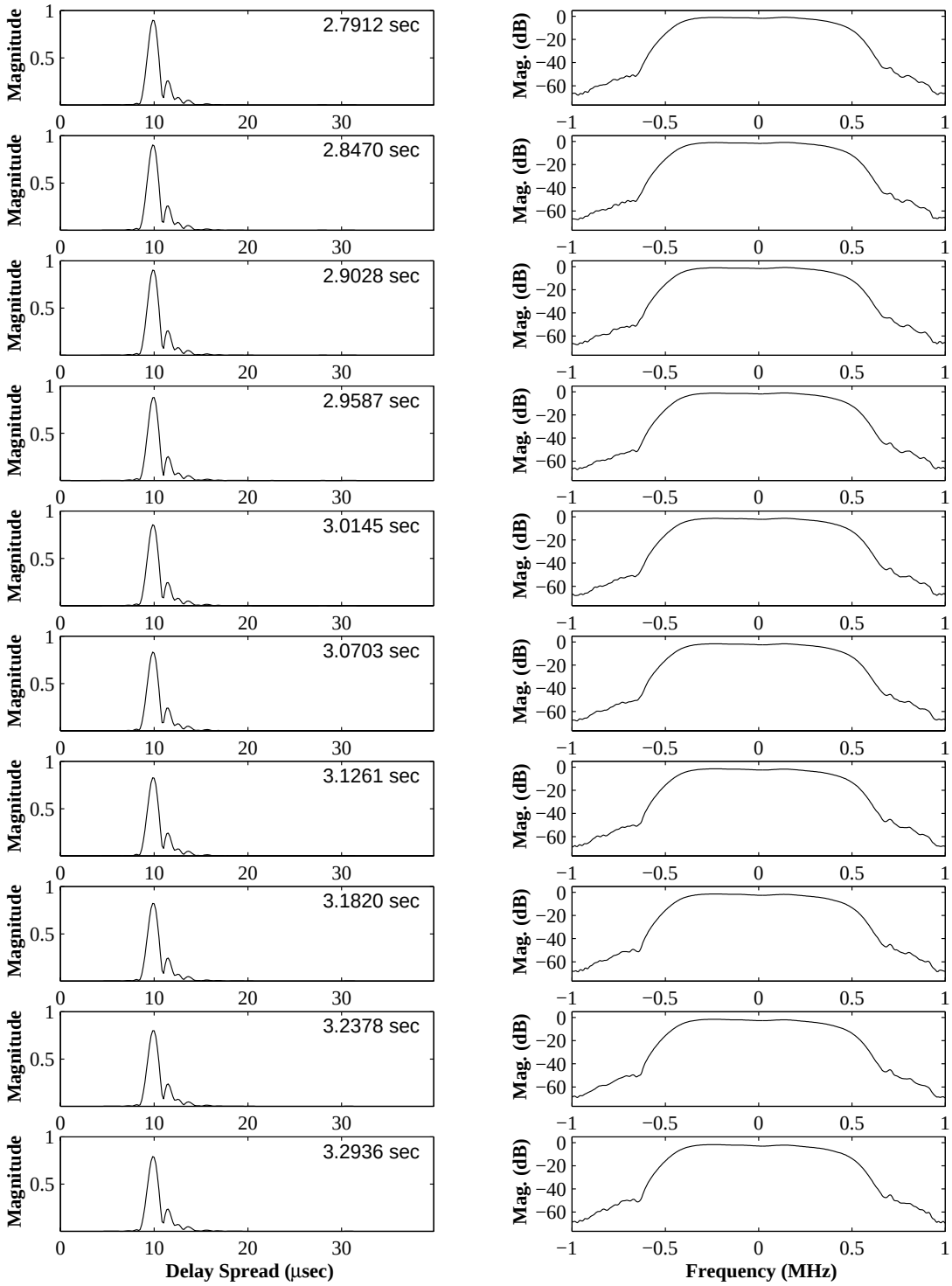

Figure 3.80: Local power delay profiles for ship21jan1739 (6).

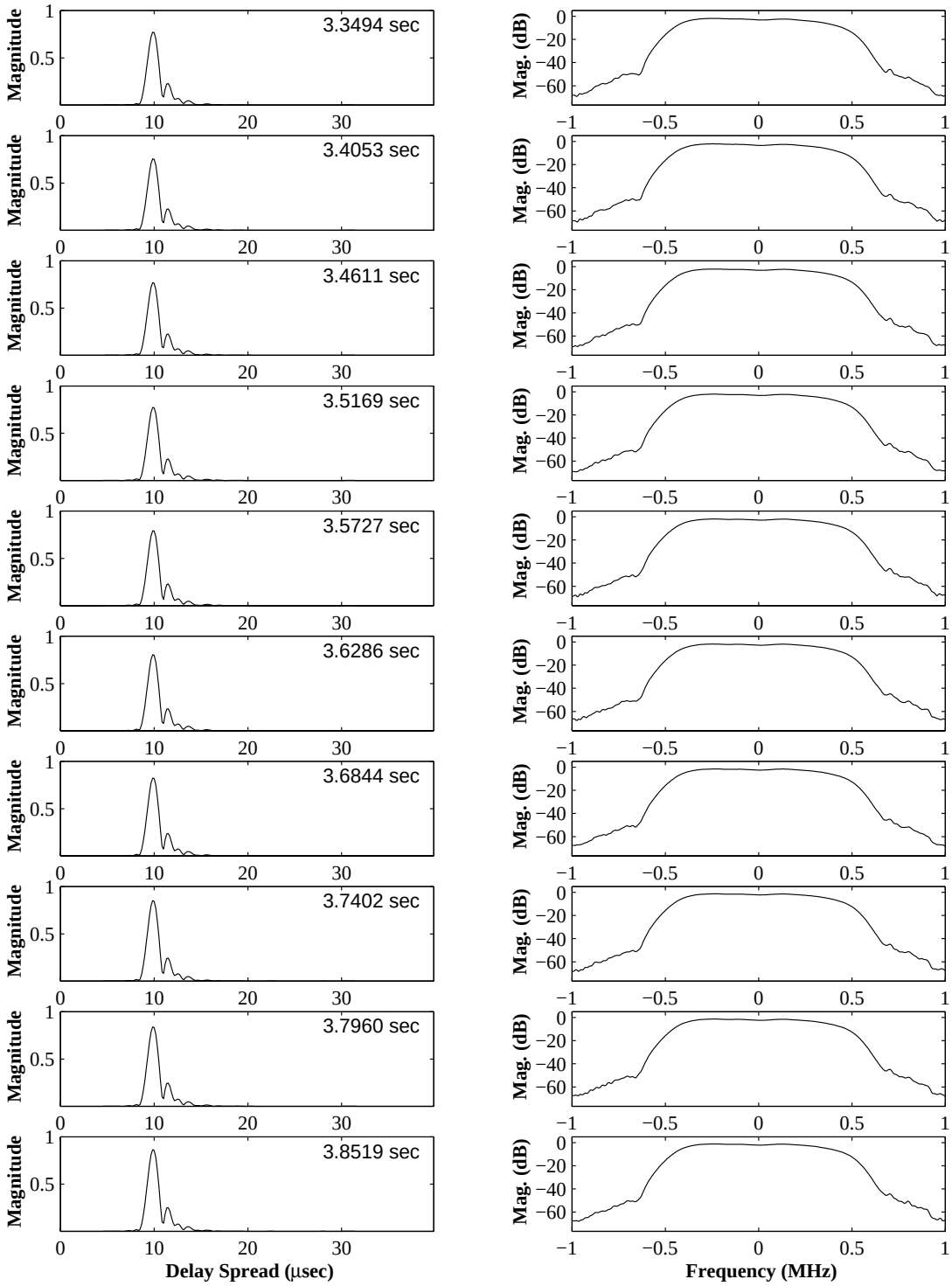

Figure 3.81: Local power delay profiles for ship21jan1739 (7).

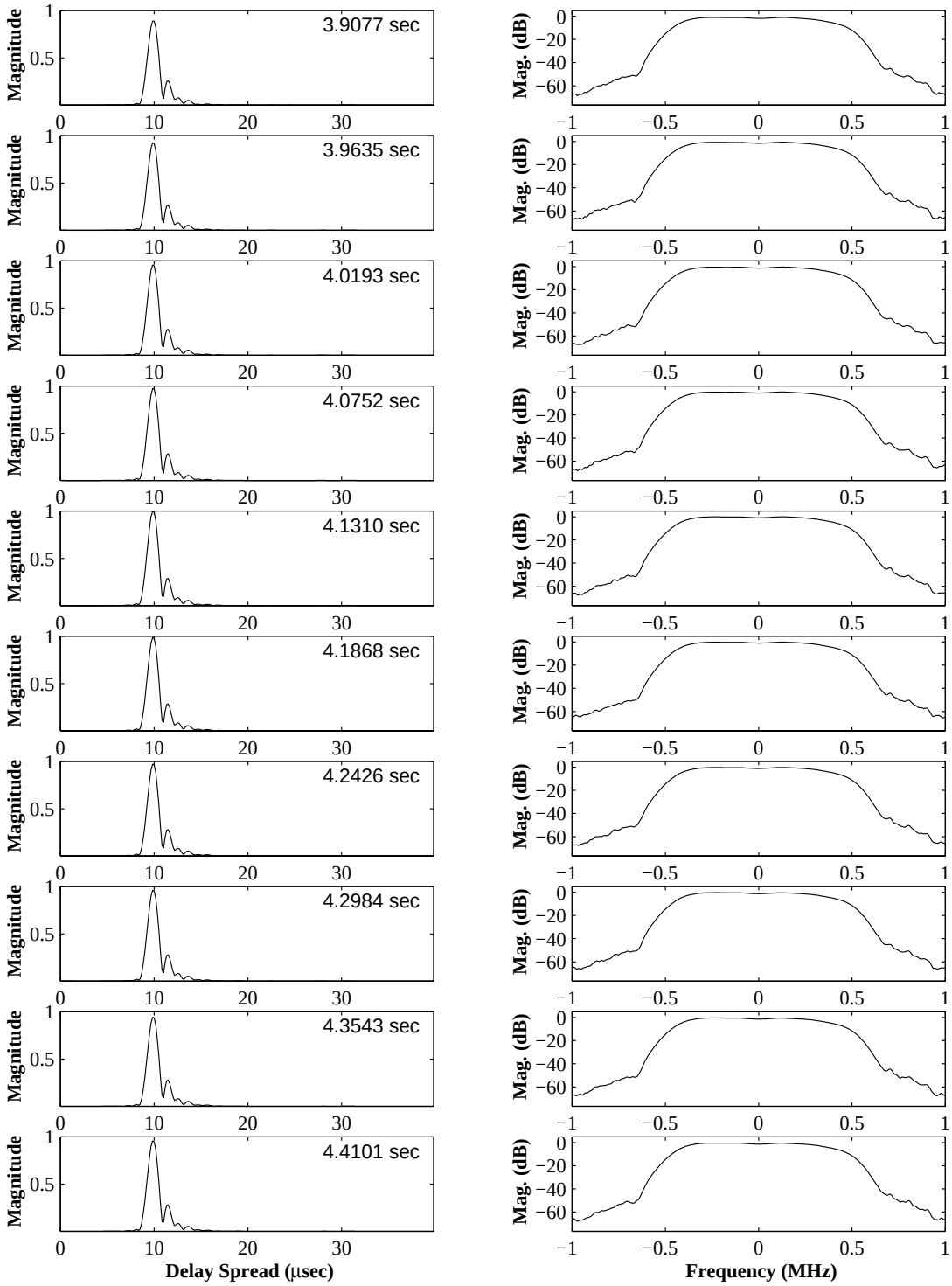

Figure 3.82: Local power delay profiles for ship21jan1739 (8).

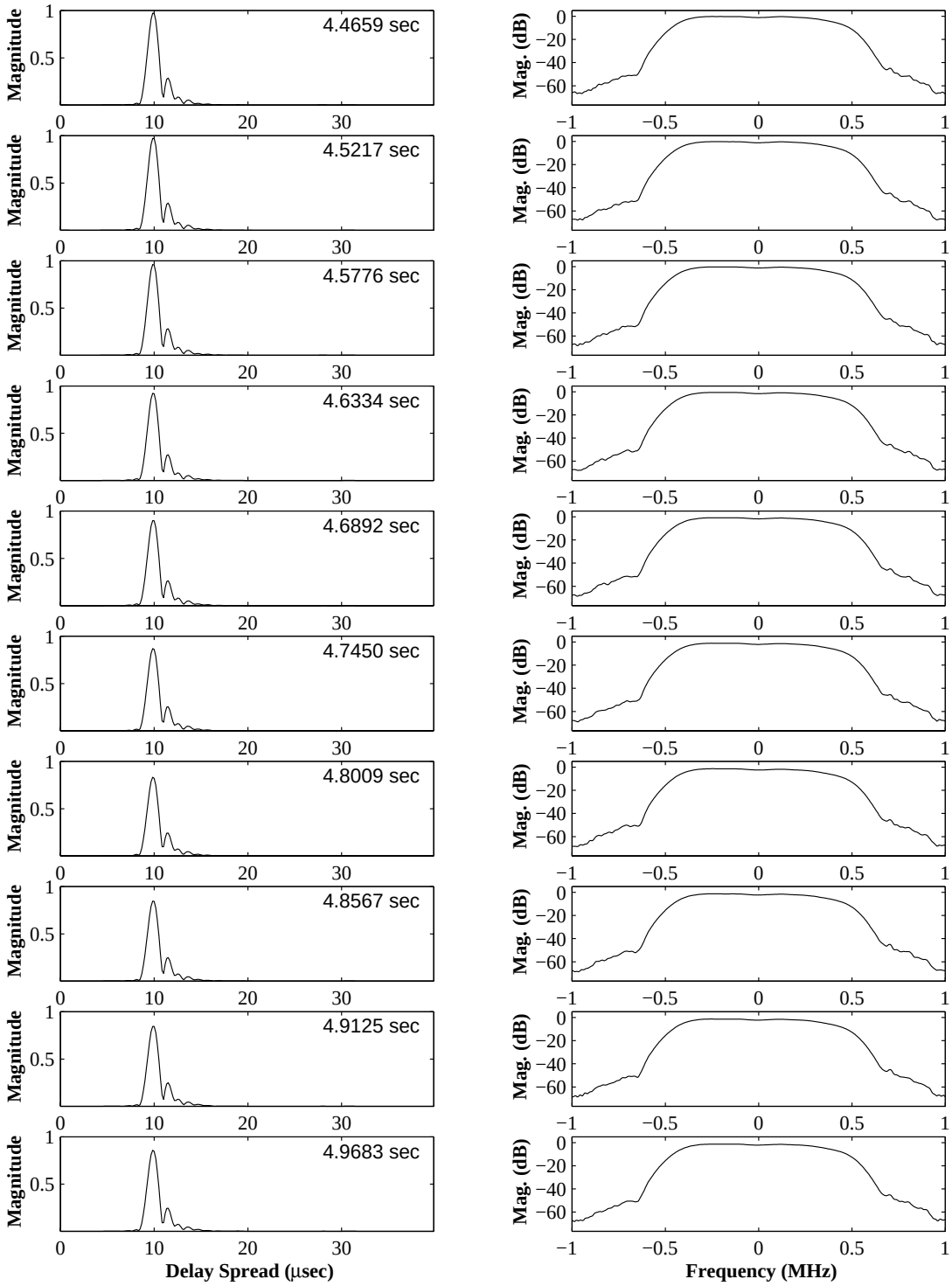

Figure 3.83: Local power delay profiles for ship21jan1739 (9).

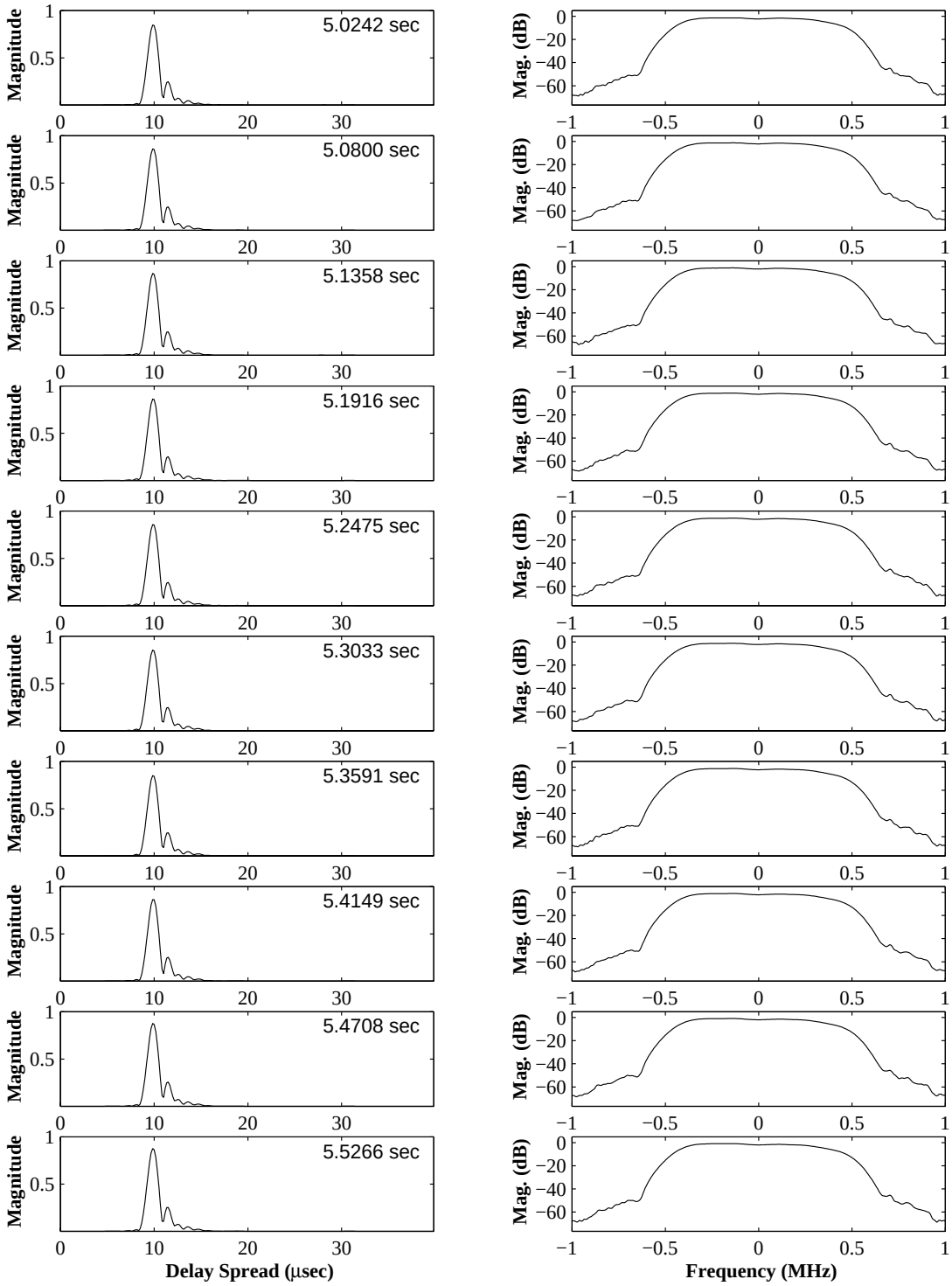

Figure 3.84: Local power delay profiles for ship21jan1739 (10).

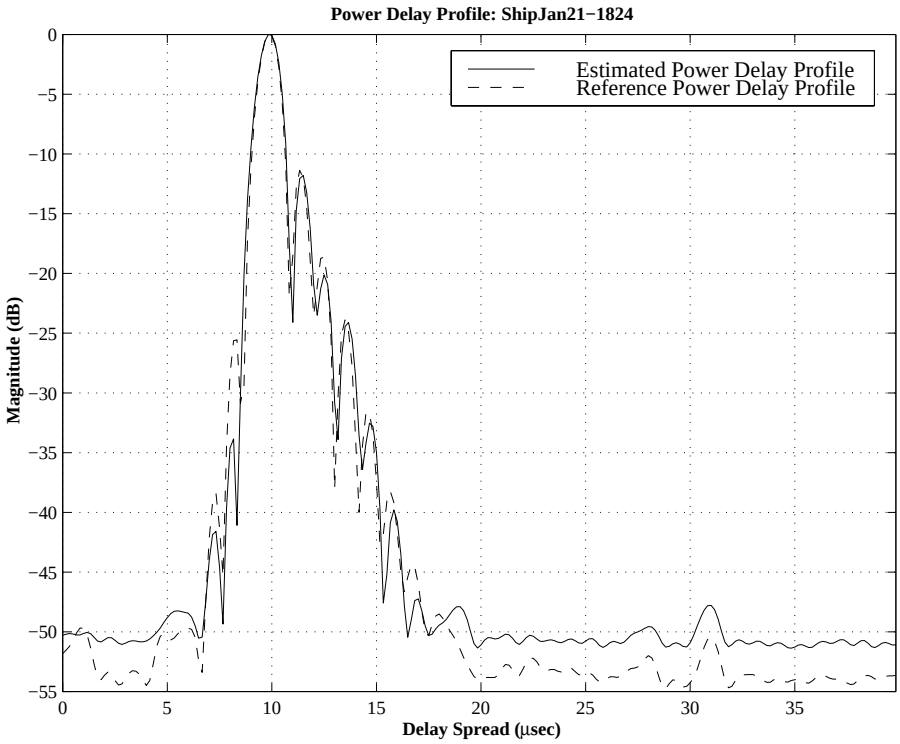

Figure 3.85: Power delay profile for ship21jan1824.

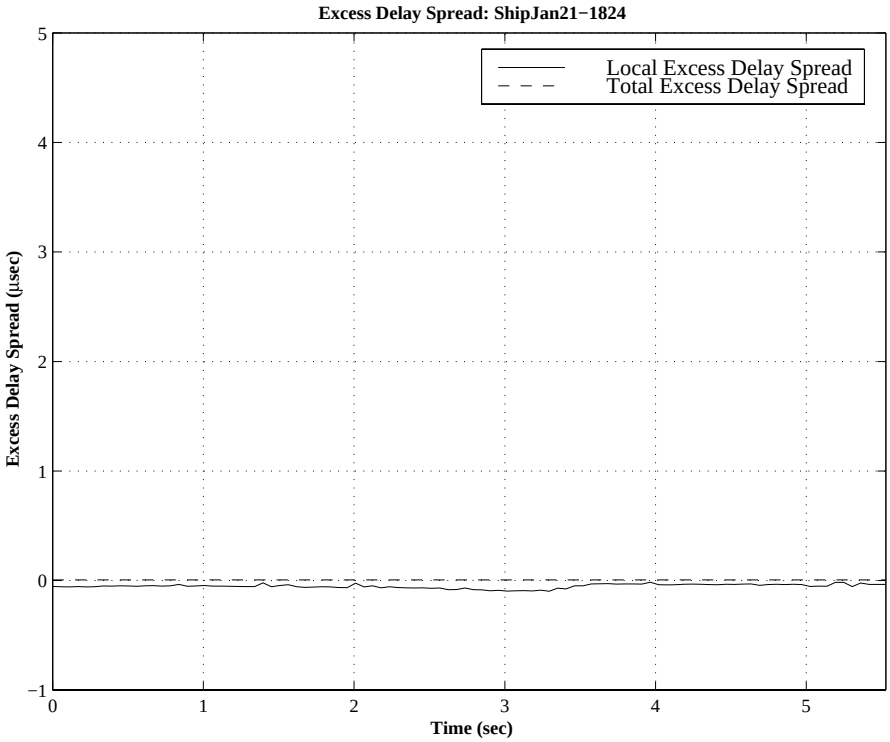

Figure 3.86: Excess delay spread for ship21jan1824.

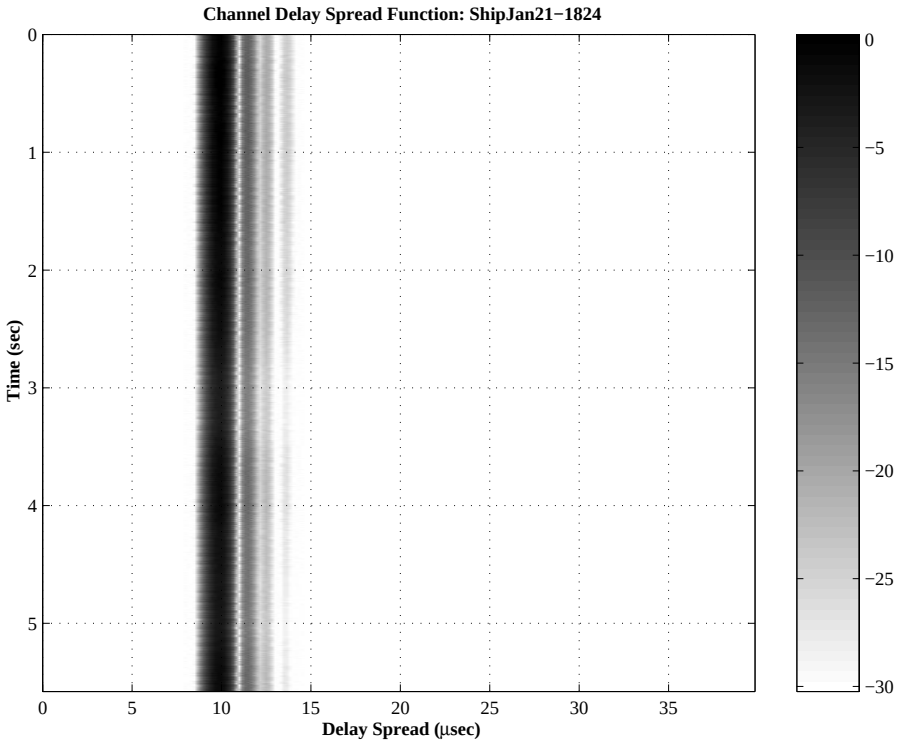

Figure 3.87: Channel delay spread function for ship21jan1824.

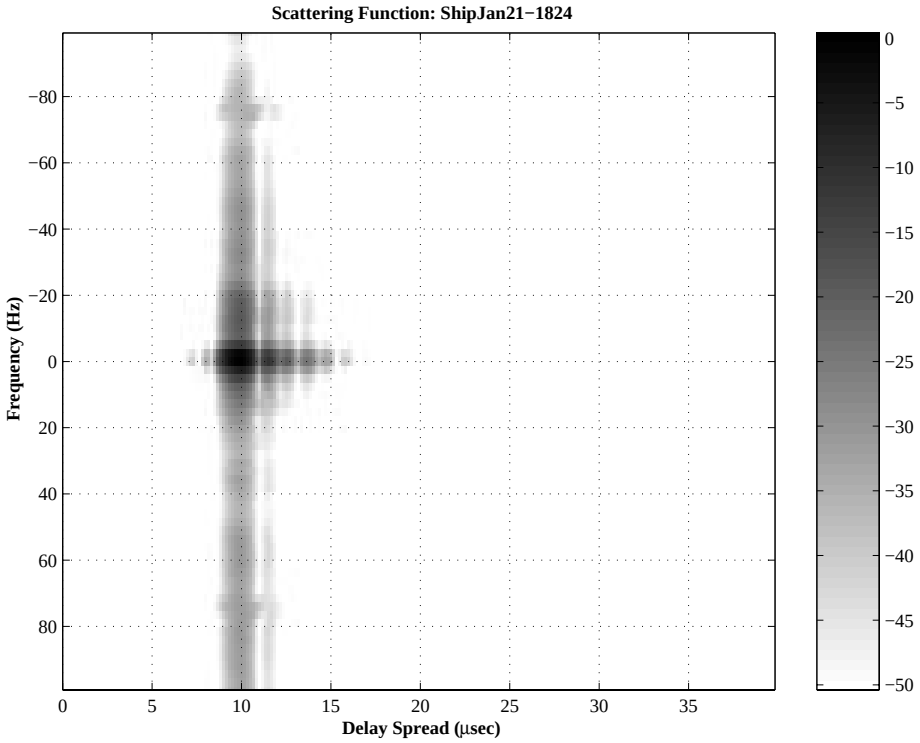

Figure 3.88: Scattering function for ship21jan1824.

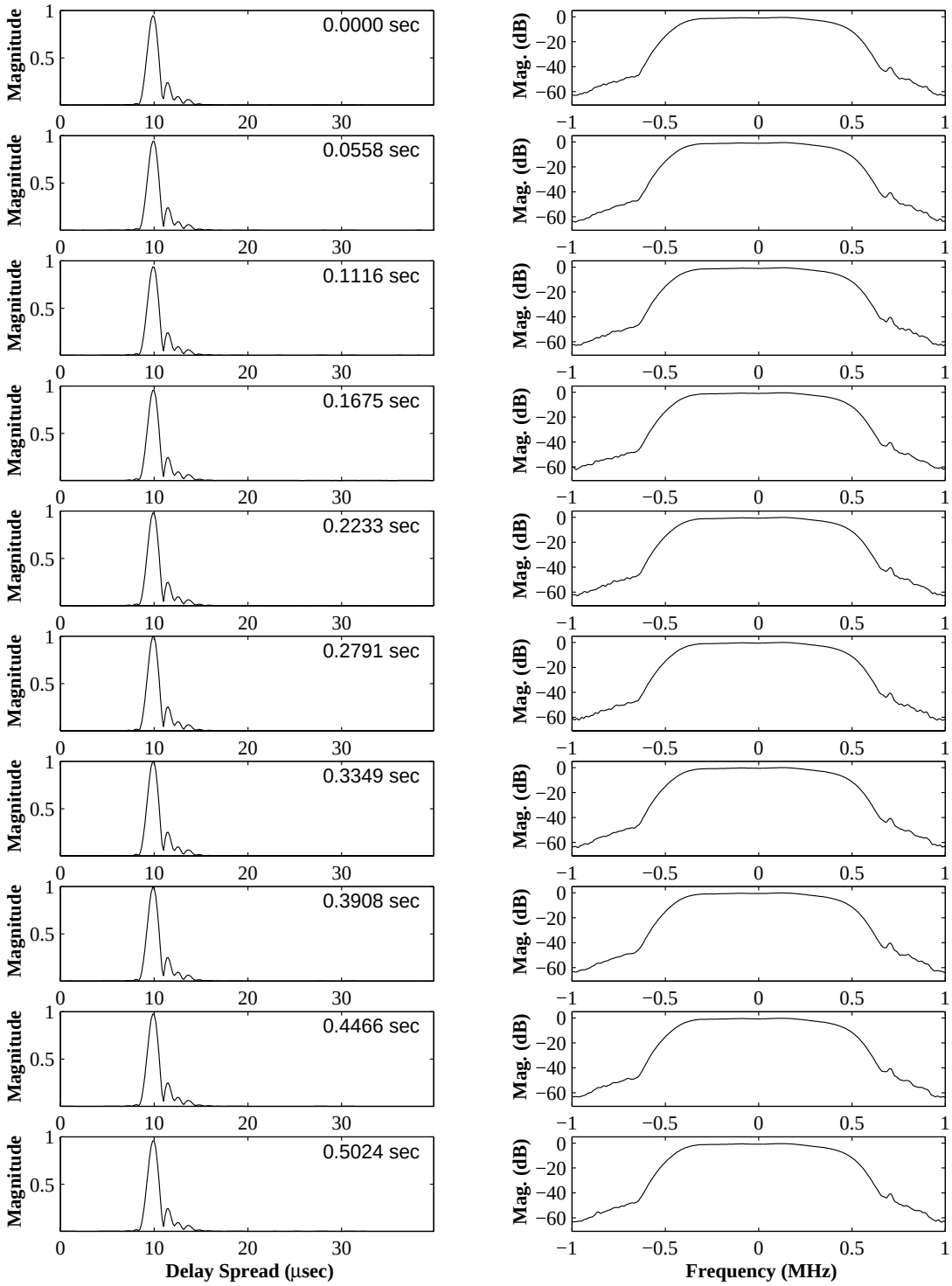

Figure 3.89: Local power delay profiles for ship21jan1824 (1).

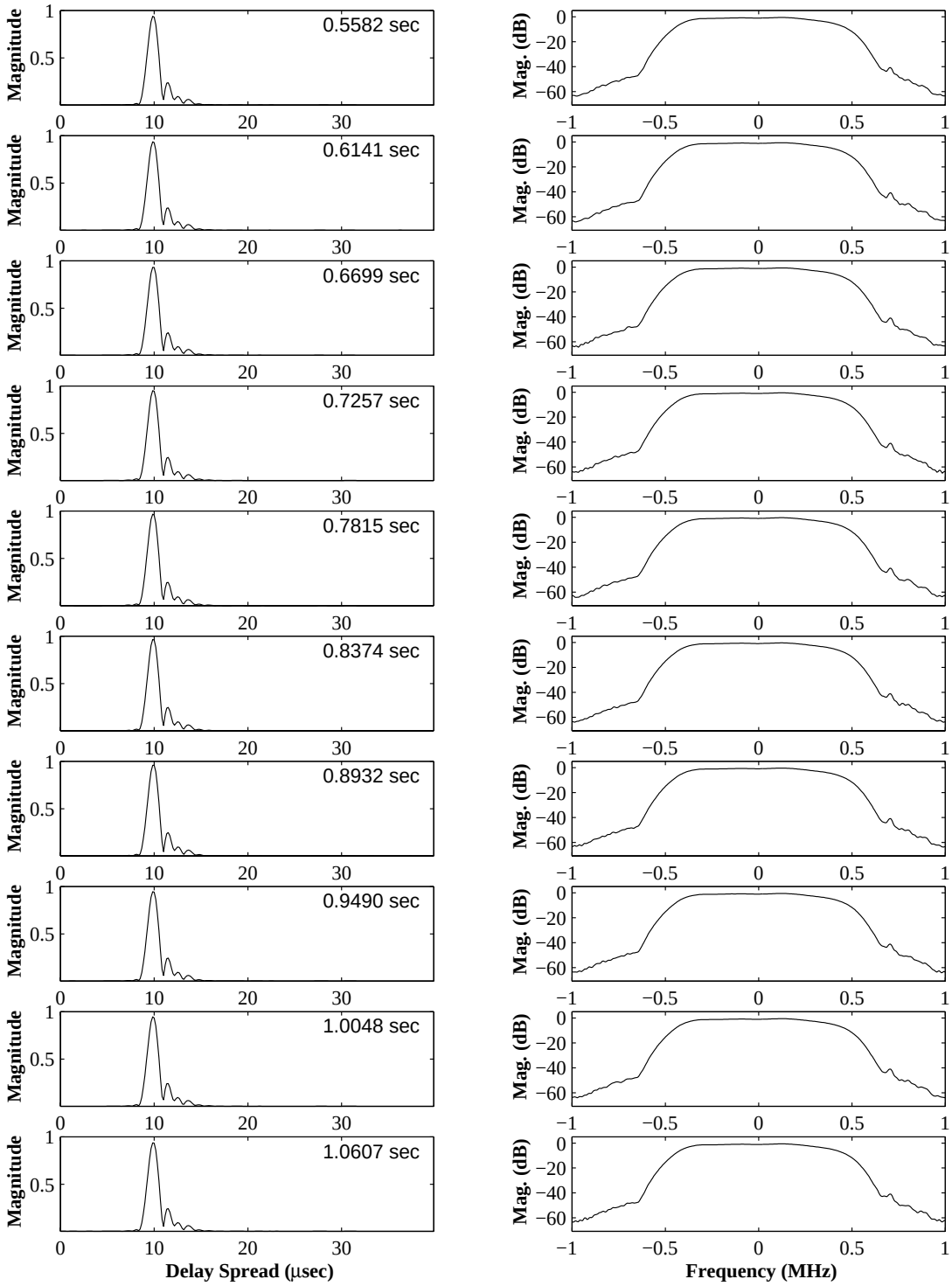

Figure 3.90: Local power delay profiles for ship21jan1824 (2).

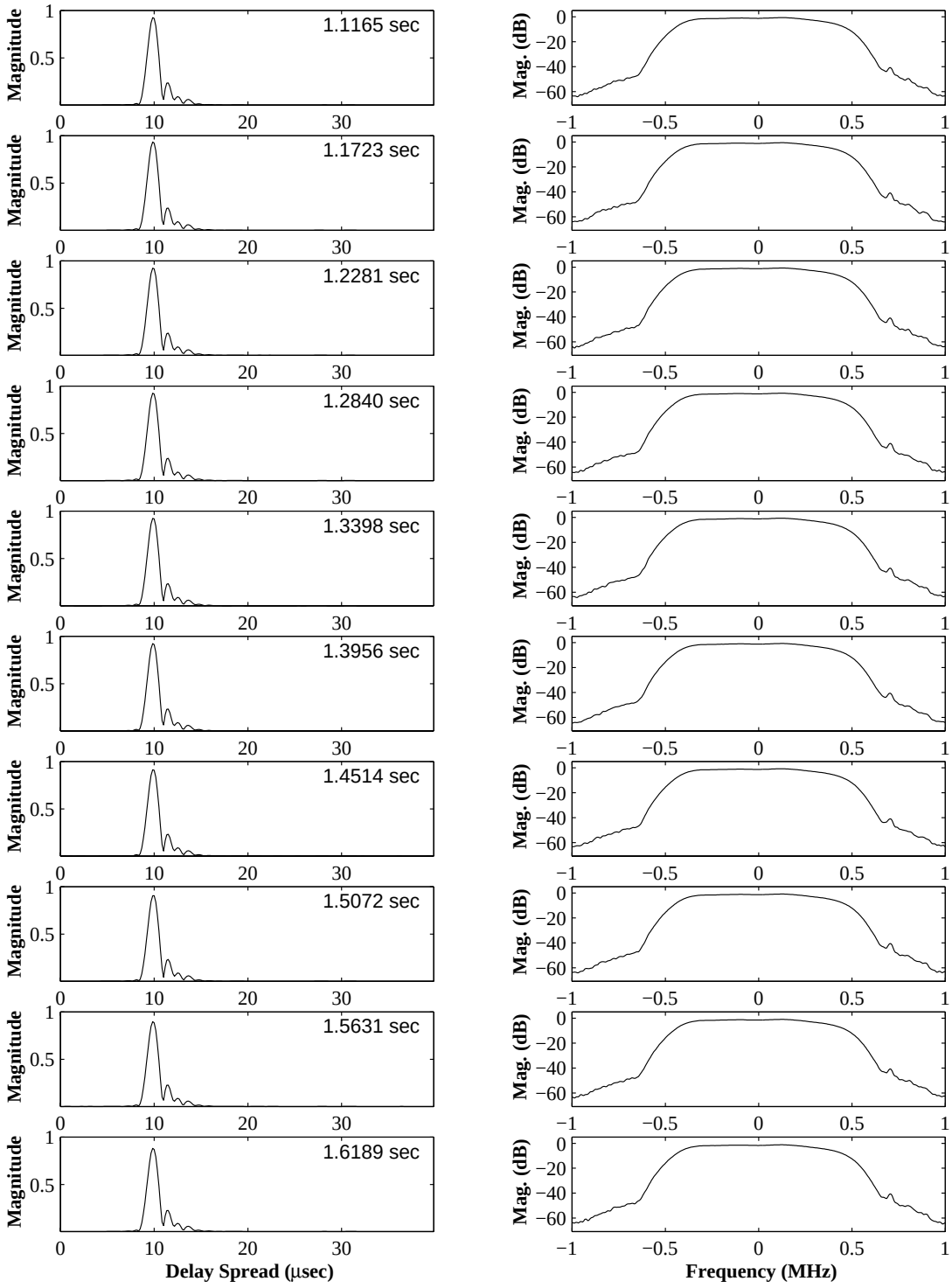

Figure 3.91: Local power delay profiles for ship21jan1824 (3).

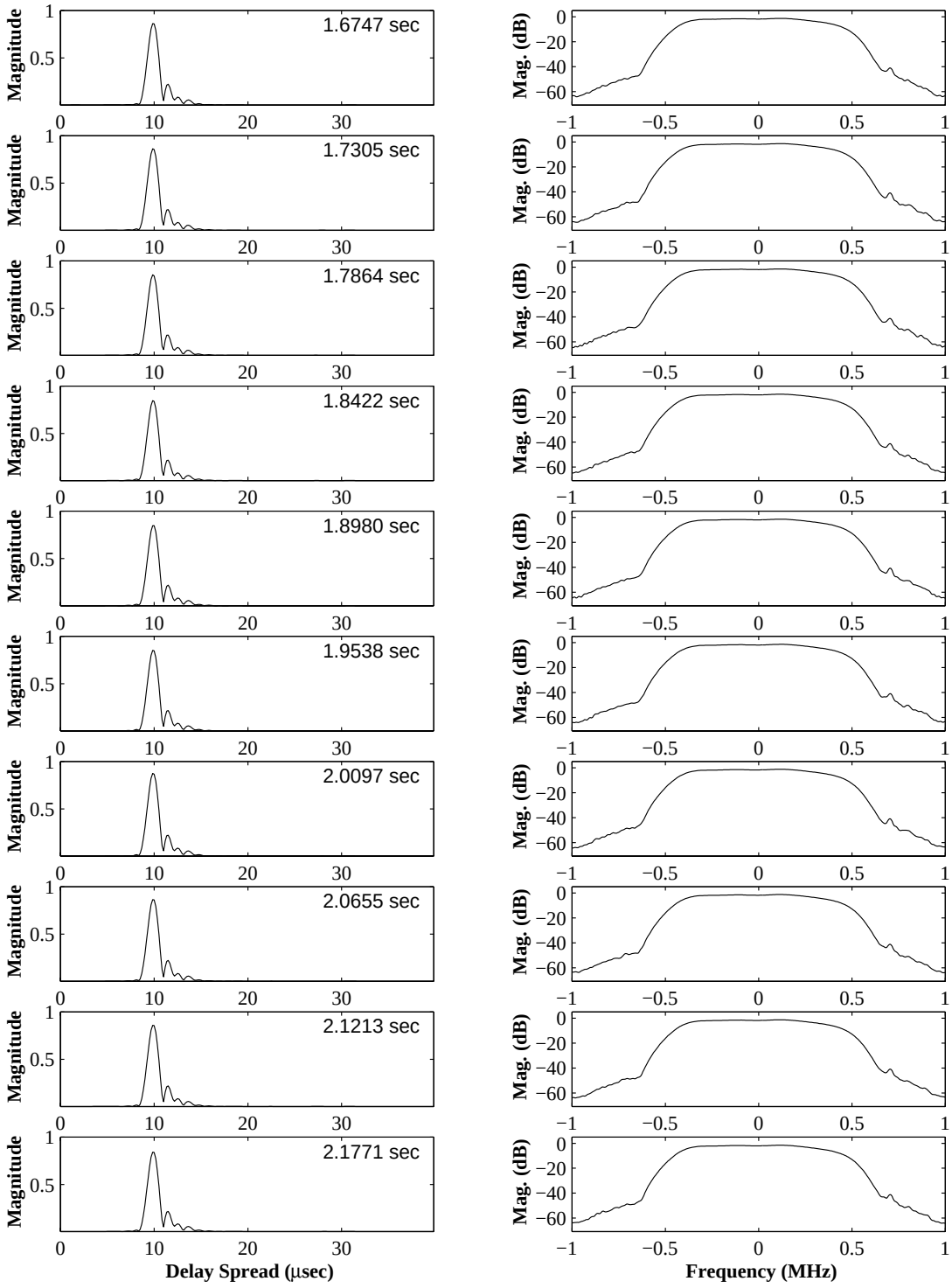

Figure 3.92: Local power delay profiles for ship21jan1824 (4).

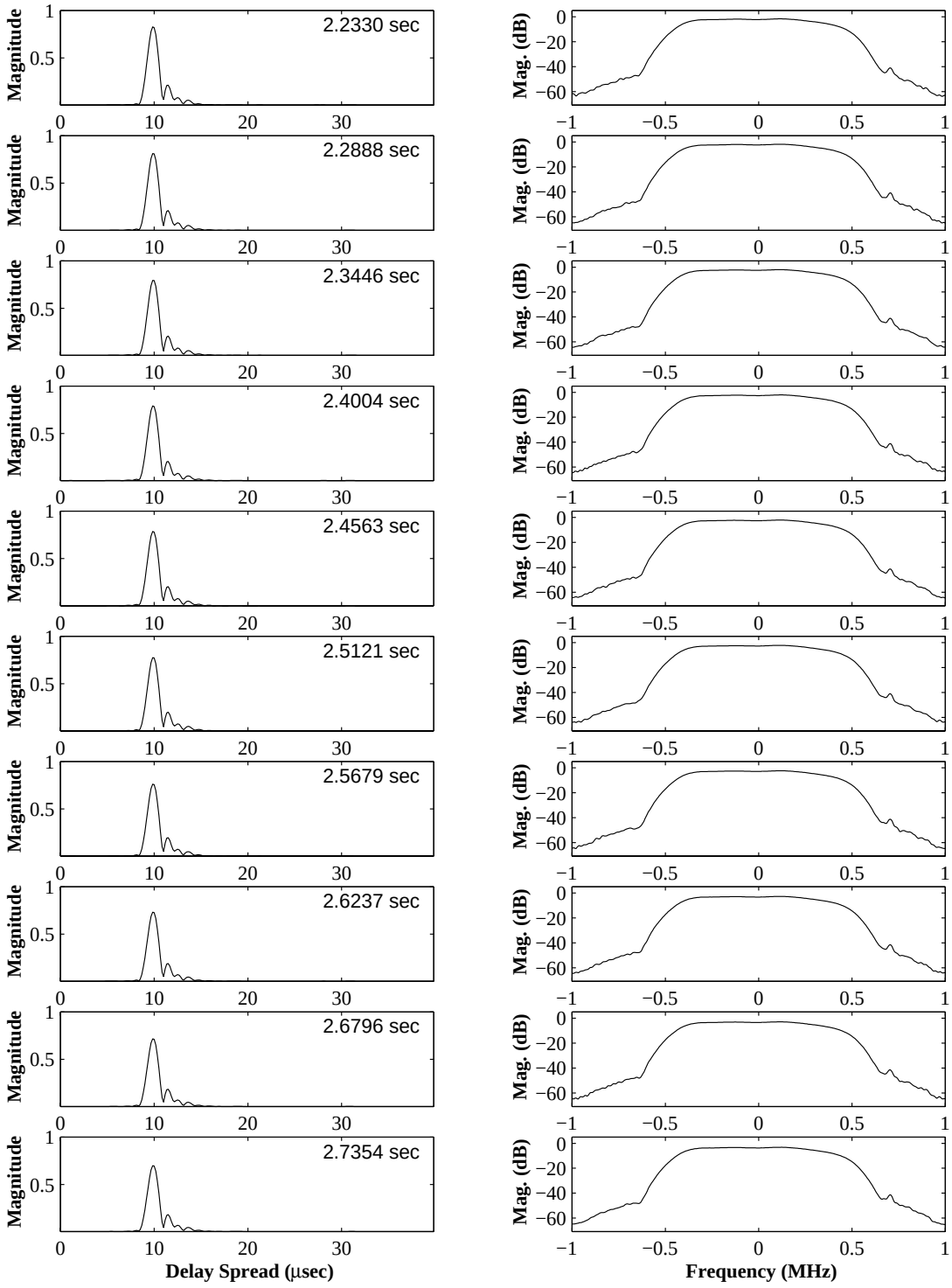

Figure 3.93: Local power delay profiles for ship21jan1824 (5).

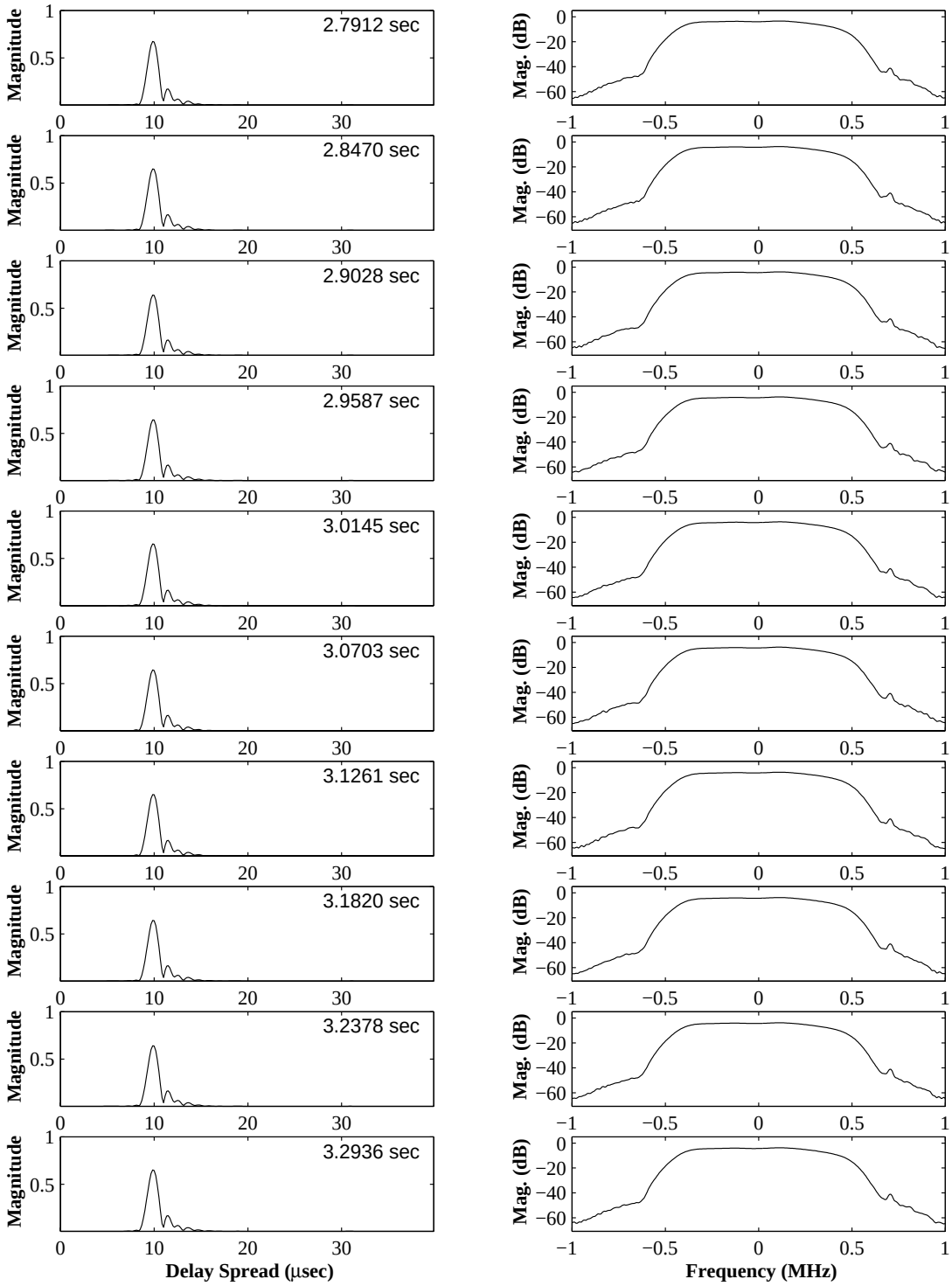

Figure 3.94: Local power delay profiles for ship21jan1824 (6).

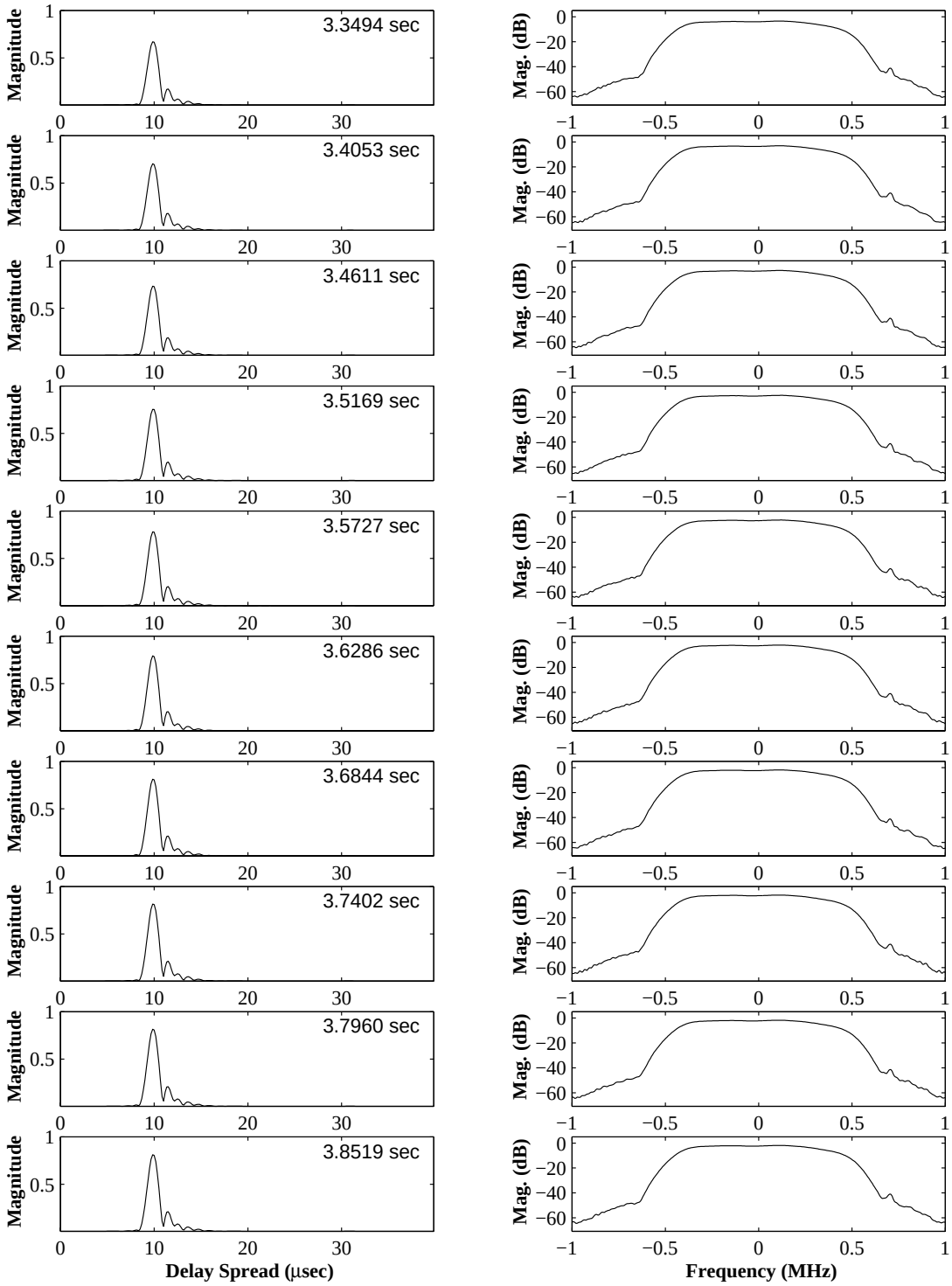

Figure 3.95: Local power delay profiles for ship21jan1824 (7).

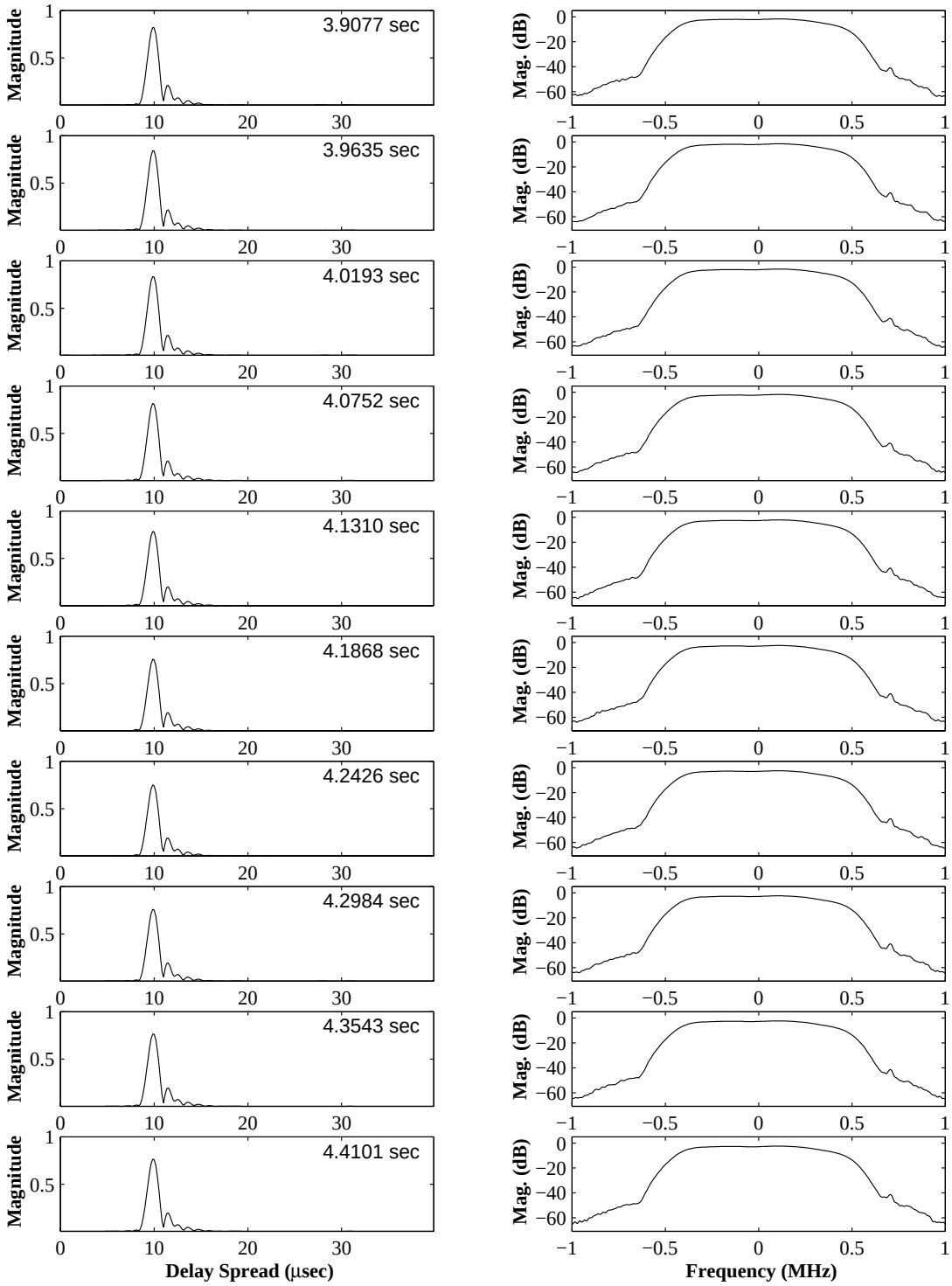

Figure 3.96: Local power delay profiles for ship21jan1824 (8).

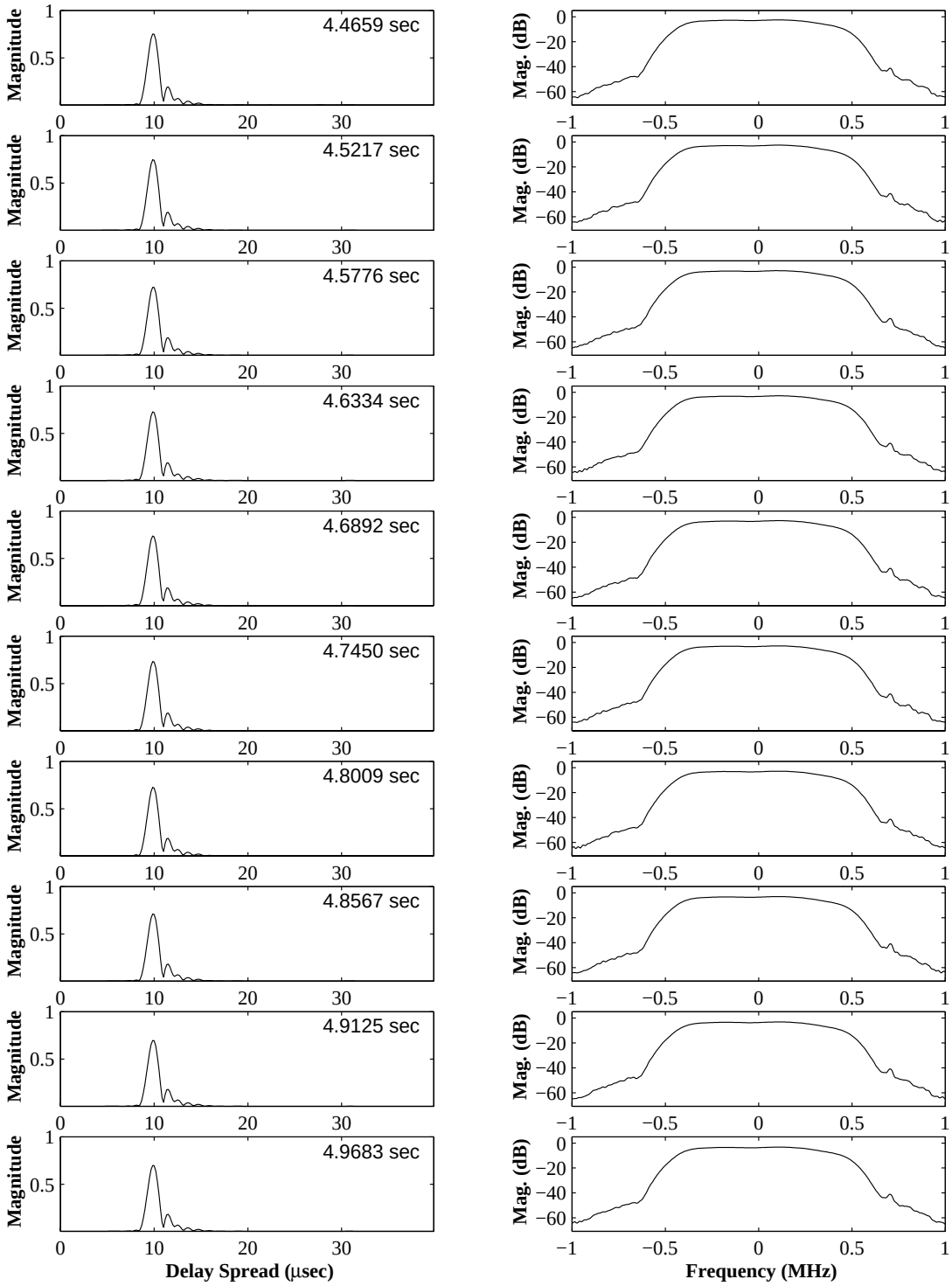

Figure 3.97: Local power delay profiles for ship21jan1824 (9).

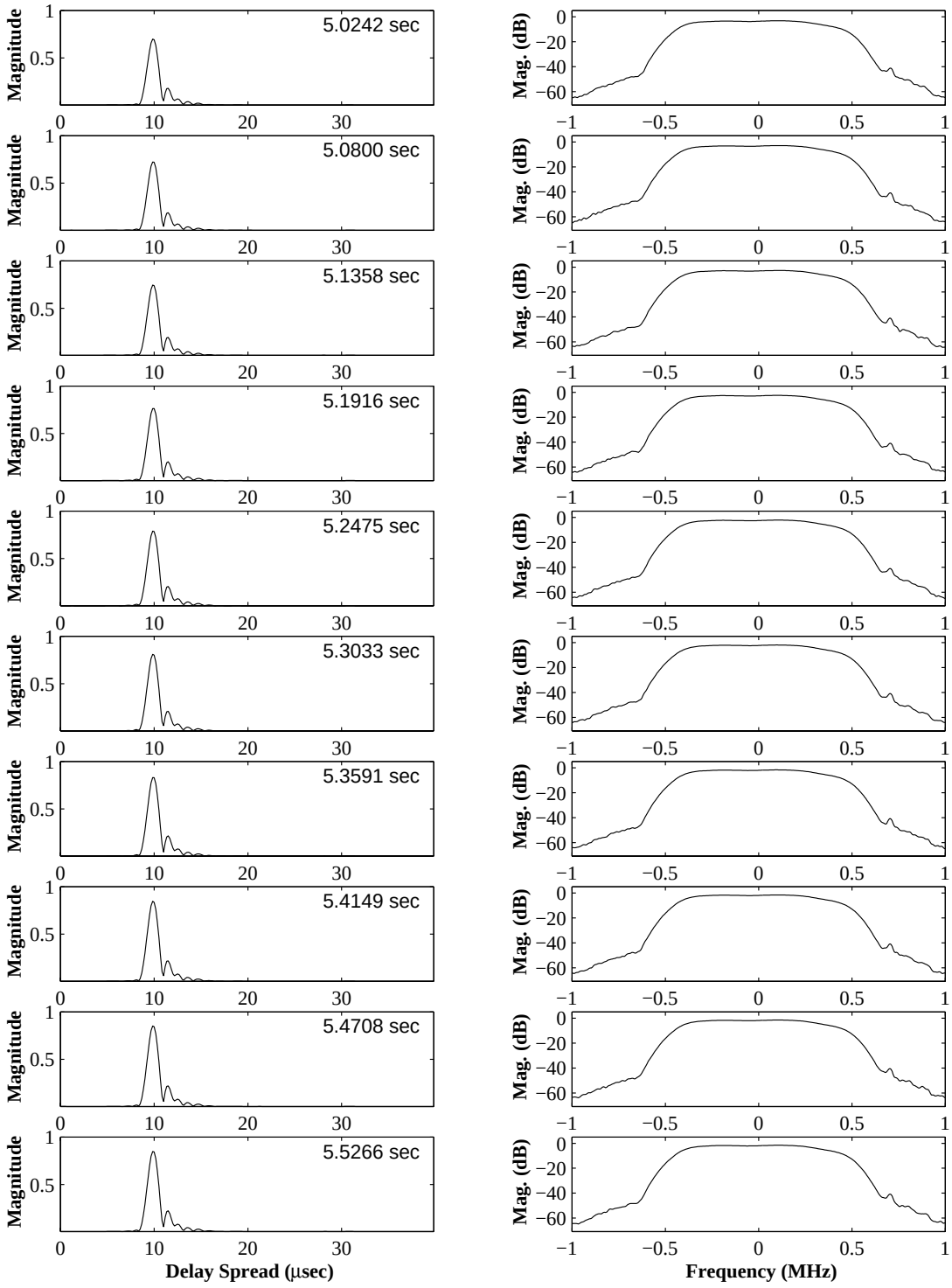

Figure 3.98: Local power delay profiles for ship21jan1824 (10).

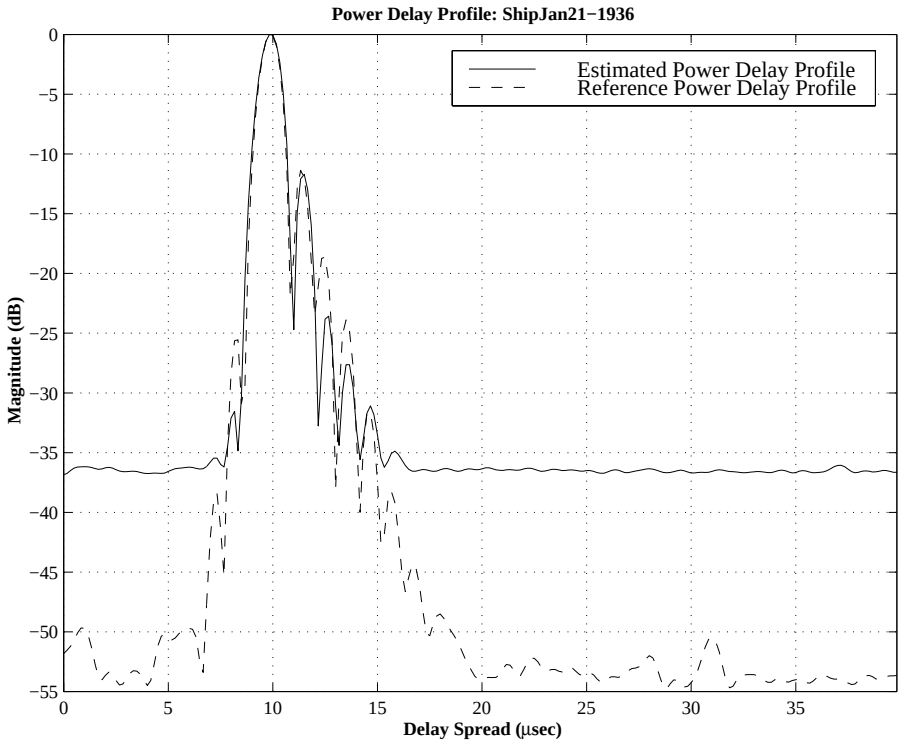

Figure 3.99: Power delay profile for ship21jan1936.

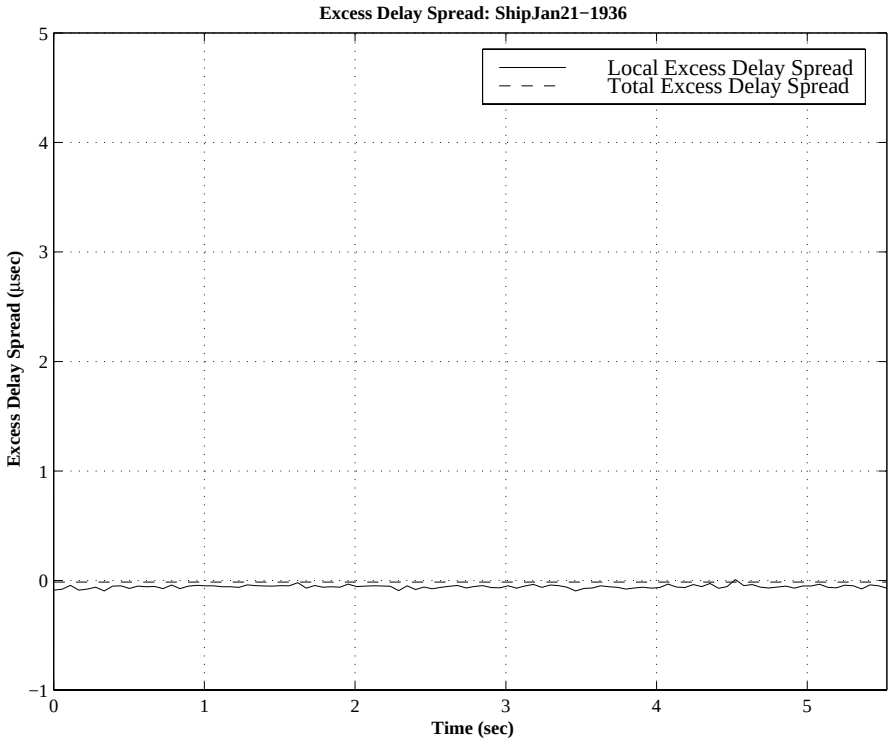

Figure 3.100: Excess delay spread for ship21jan1936.

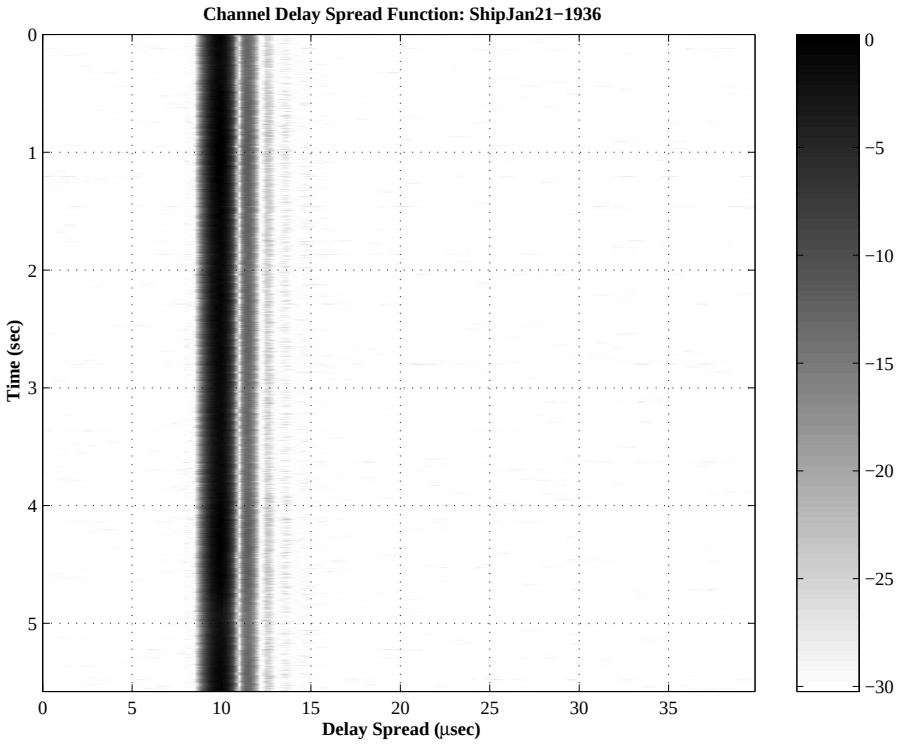

Figure 3.101: Channel delay spread function for ship21jan1936.

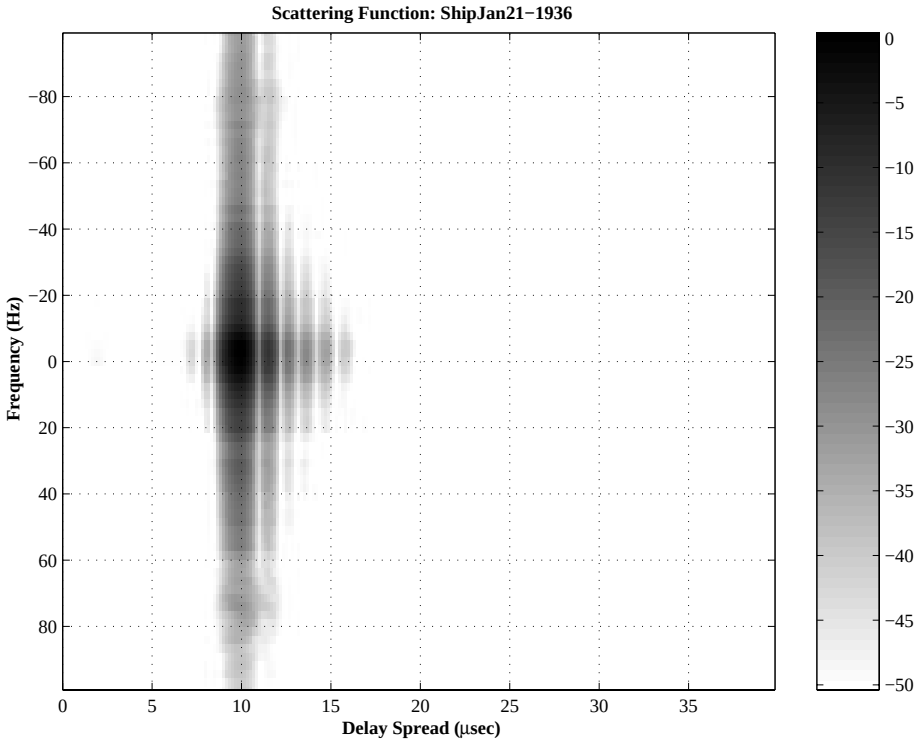

Figure 3.102: Scattering function for ship21jan1936.

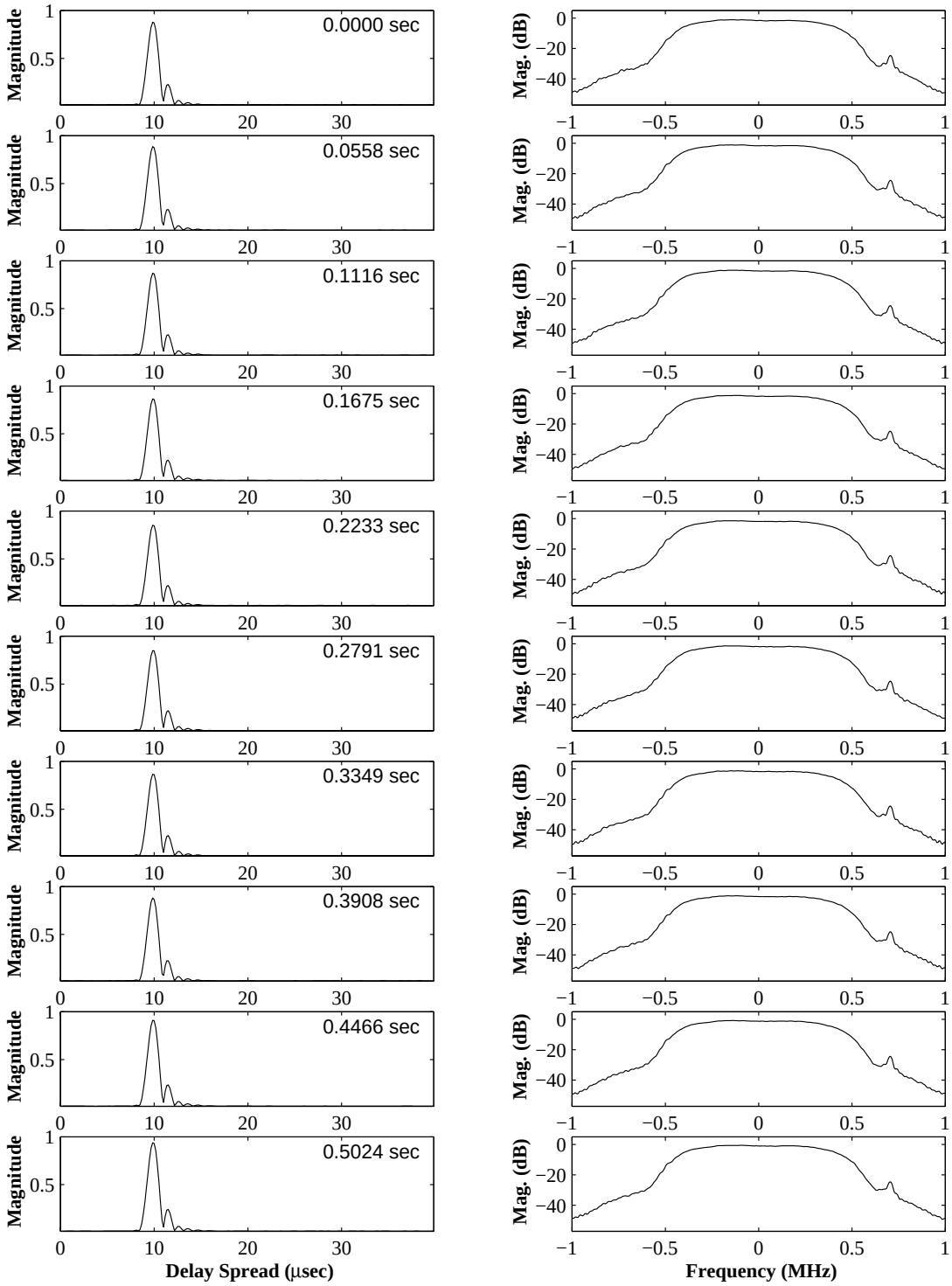

Figure 3.103: Local power delay profiles for ship21jan1936 (1).

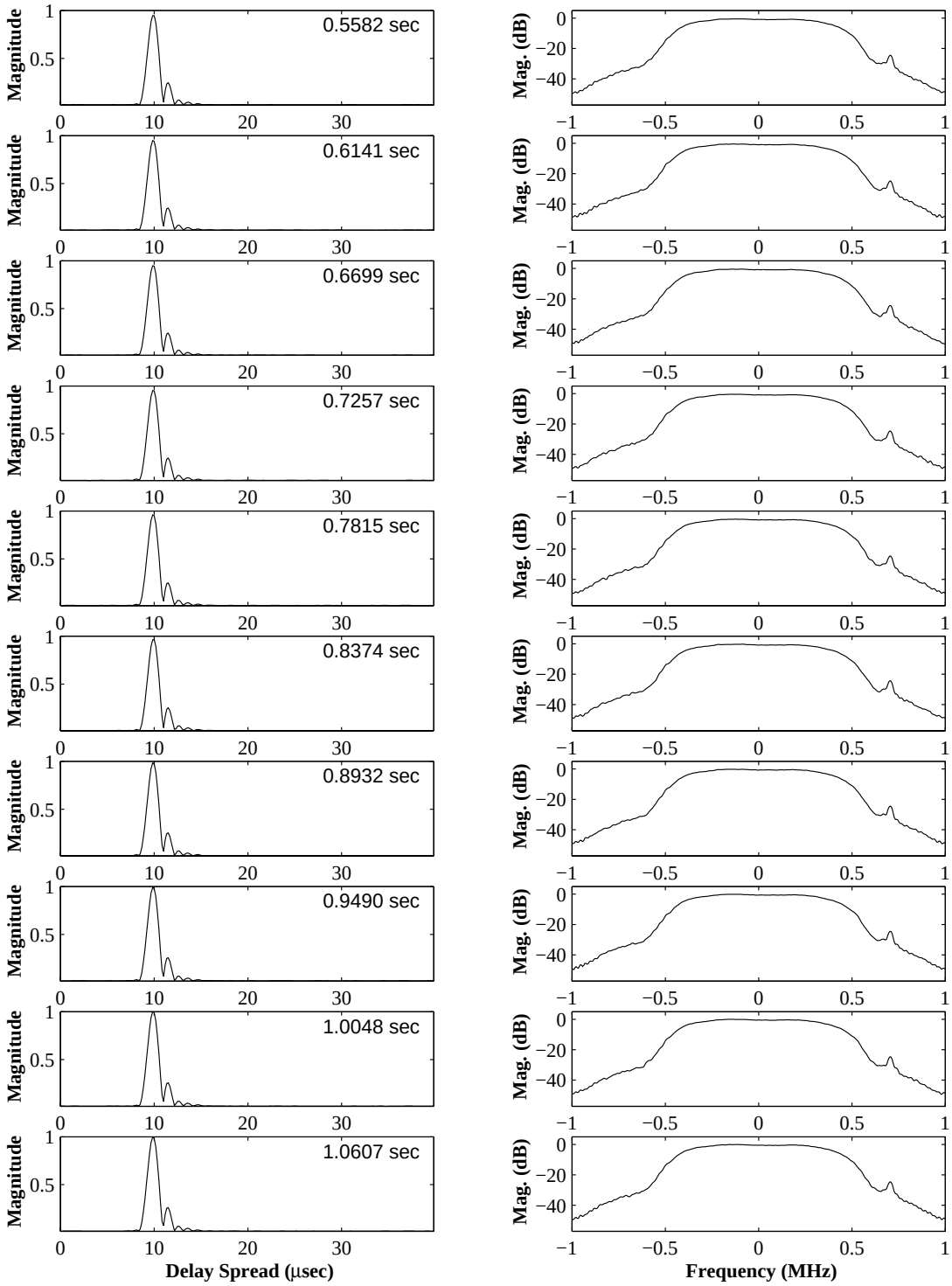

Figure 3.104: Local power delay profiles for ship21jan1936 (2).

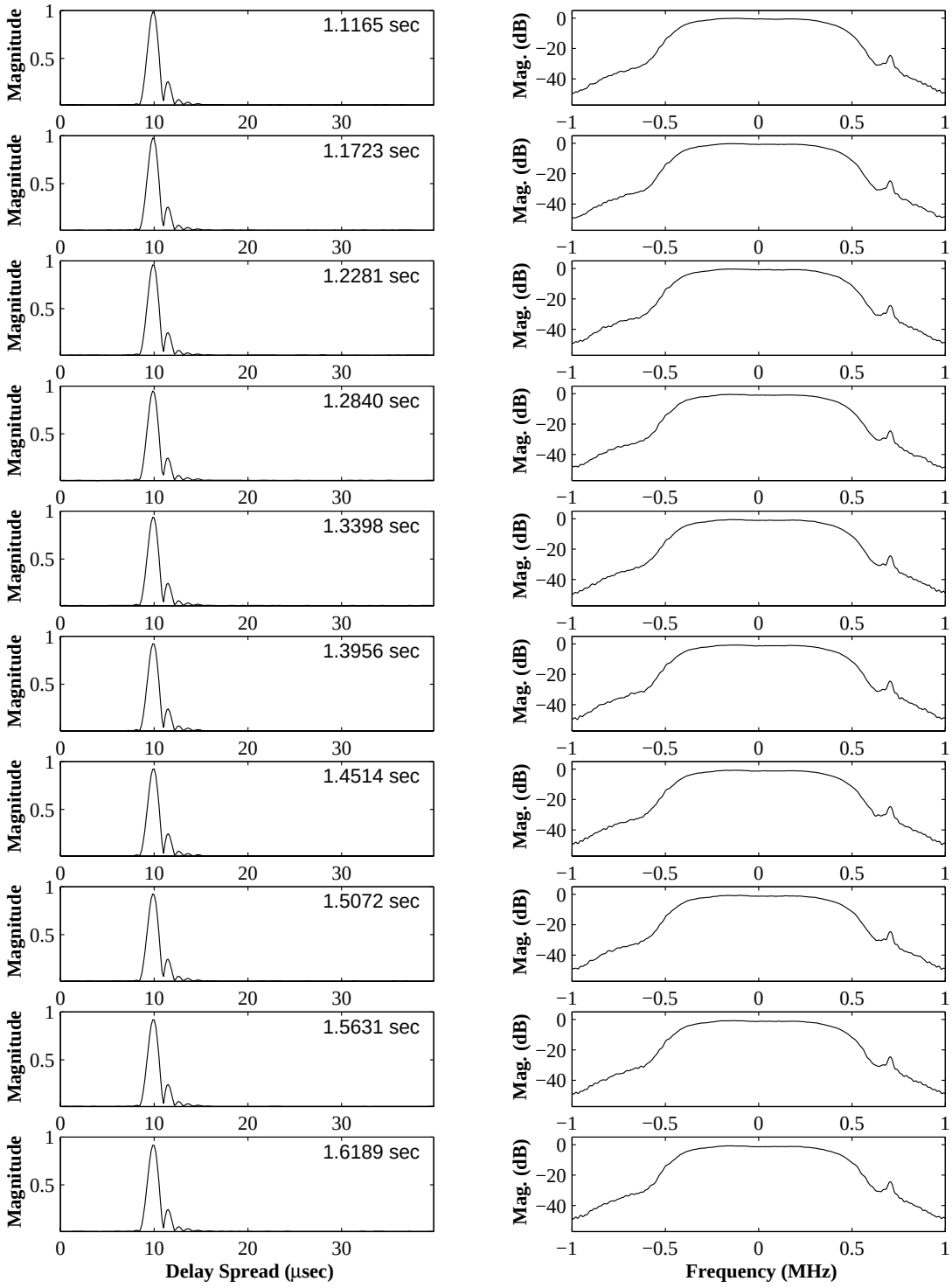

Figure 3.105: Local power delay profiles for ship21jan1936 (3).

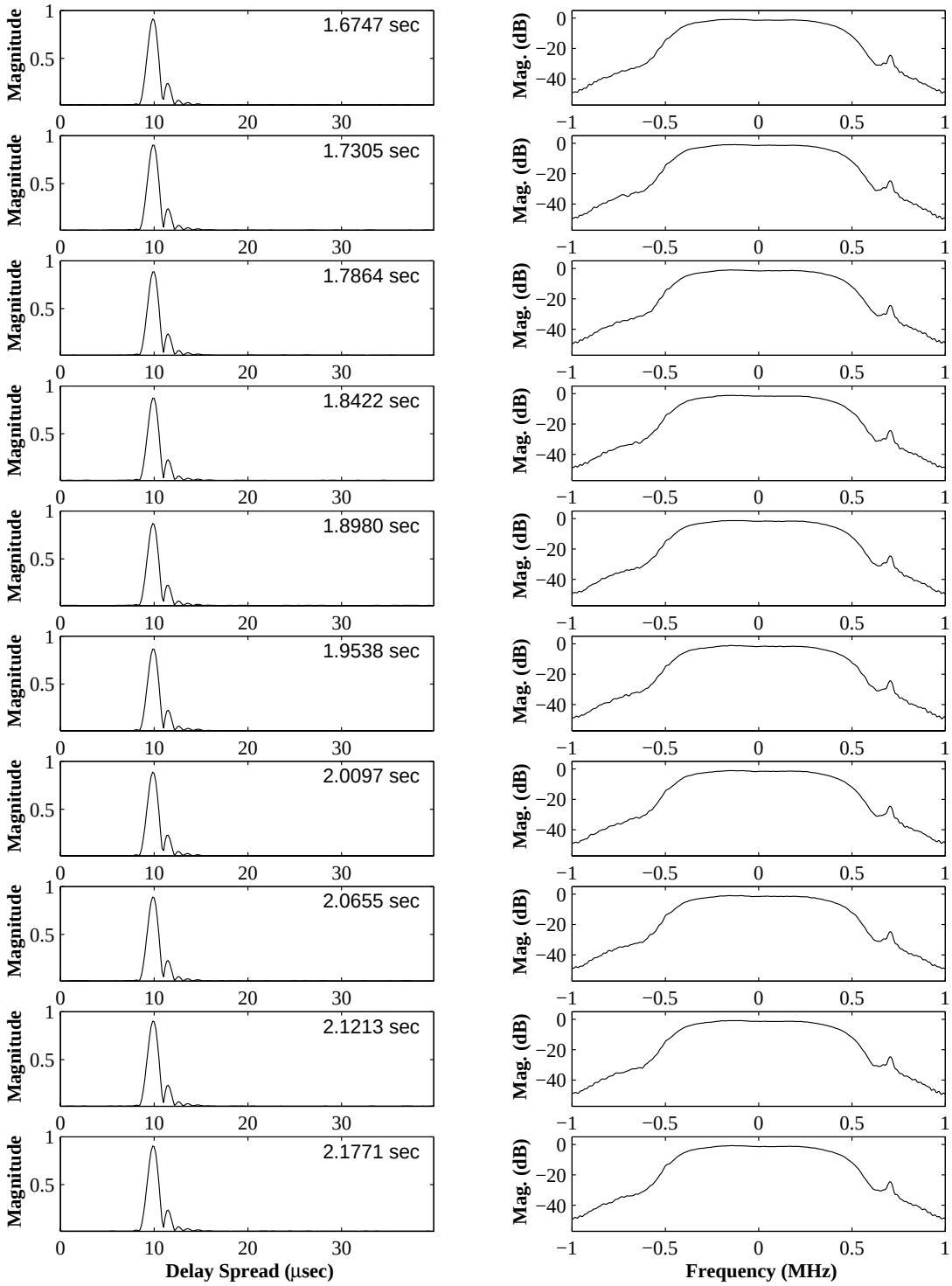

Figure 3.106: Local power delay profiles for ship21jan1936 (4).

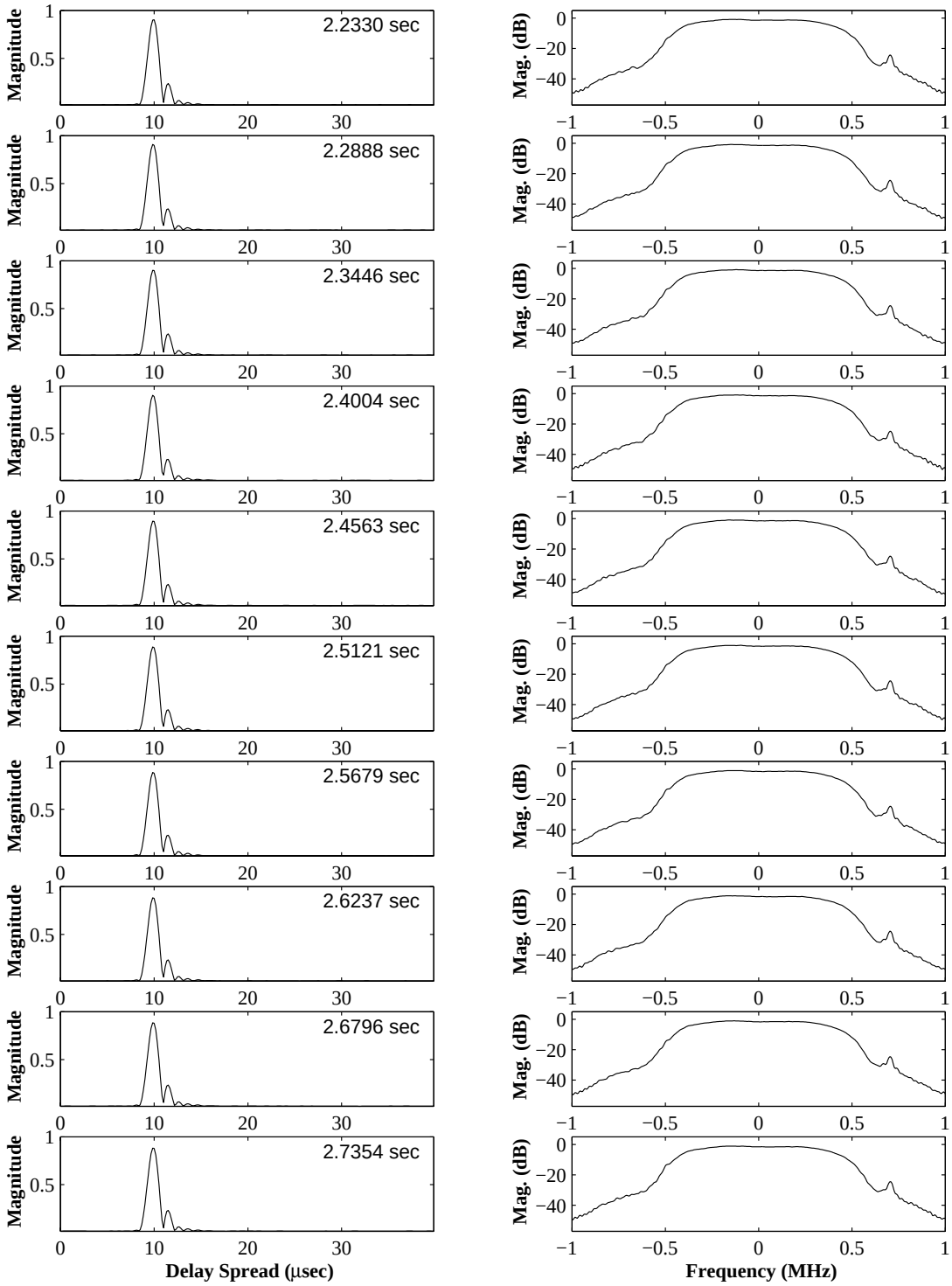

Figure 3.107: Local power delay profiles for ship21jan1936 (5).

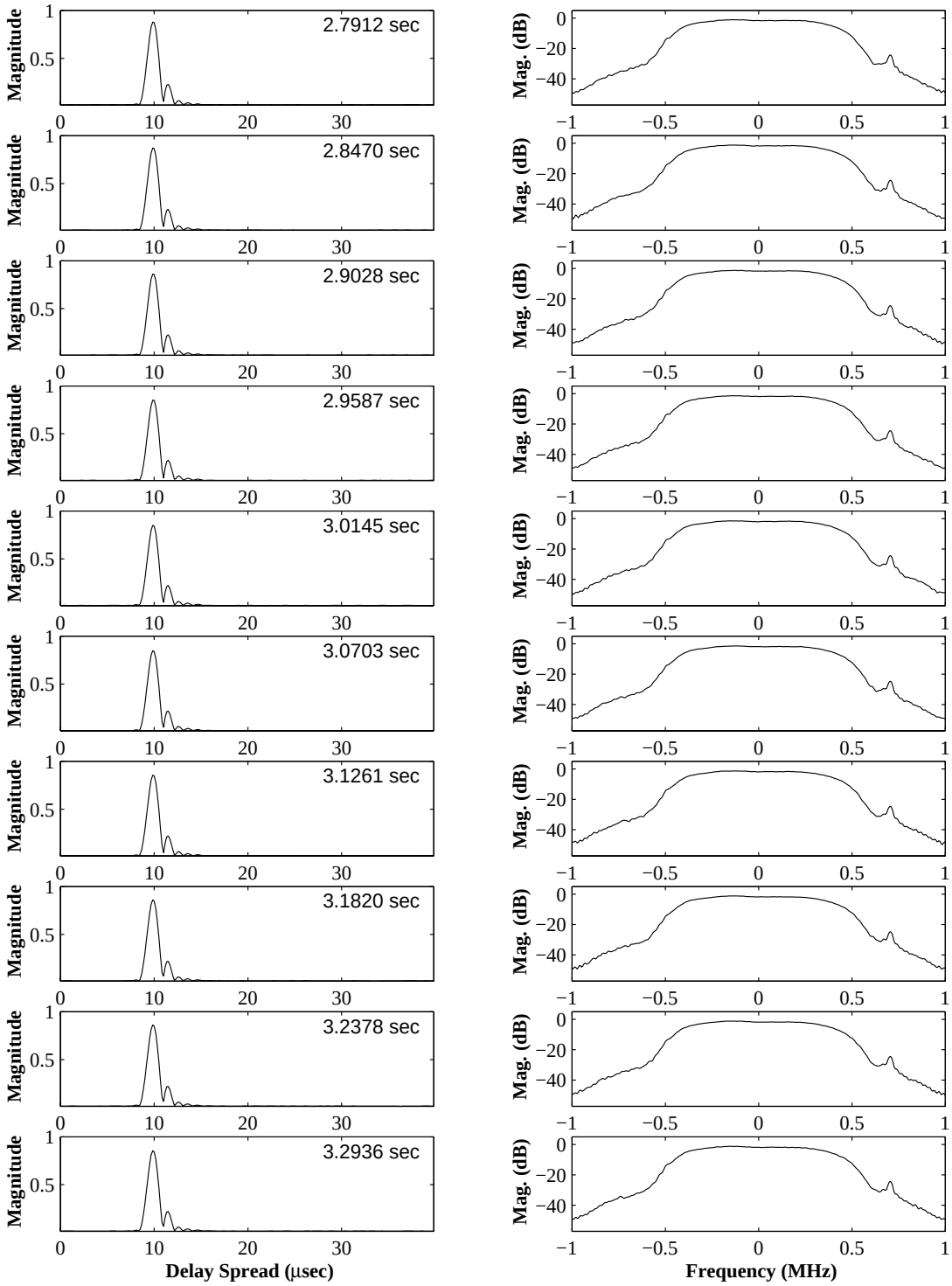

Figure 3.108: Local power delay profiles for ship21jan1936 (6).

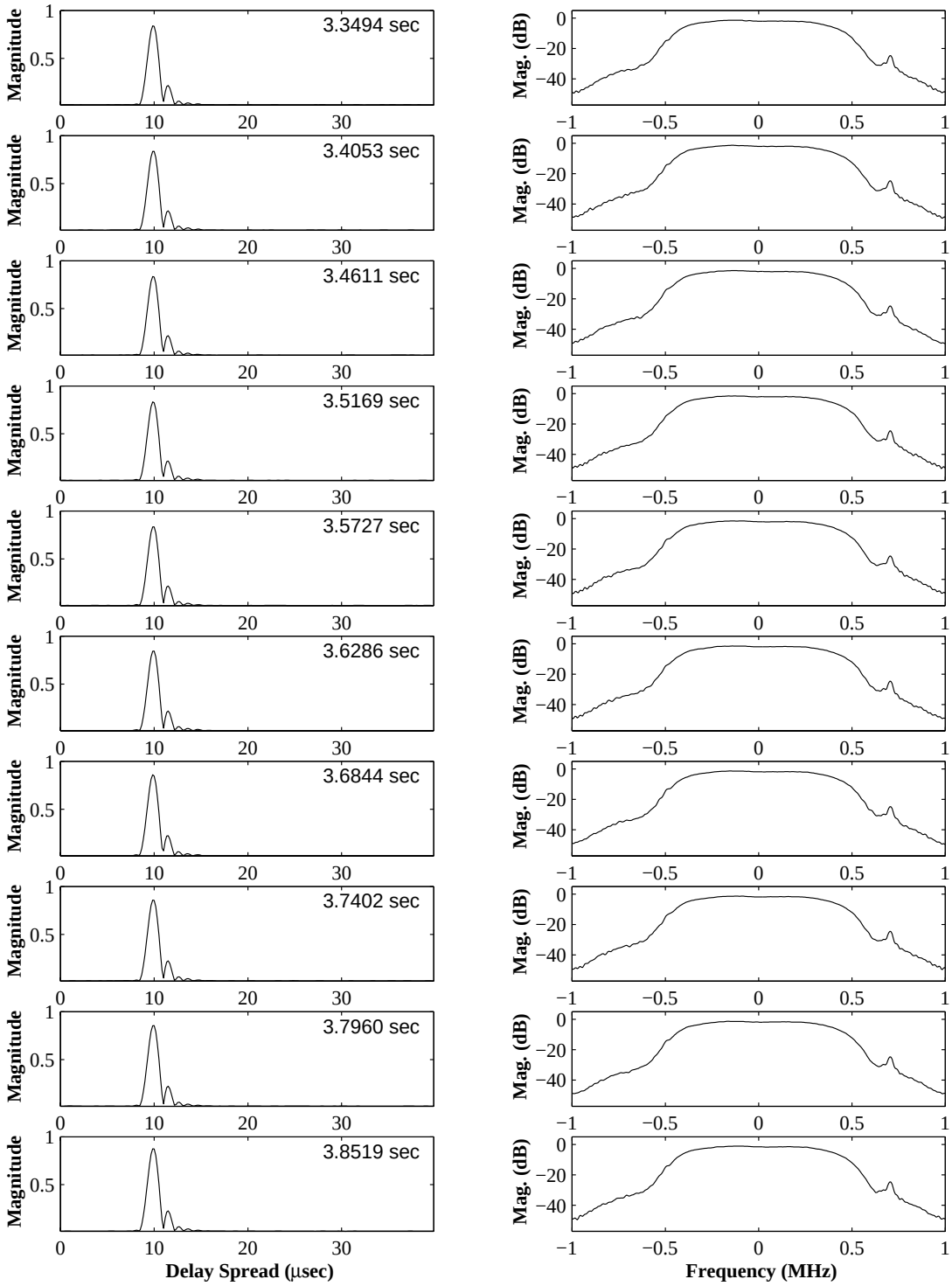

Figure 3.109: Local power delay profiles for ship21jan1936 (7).

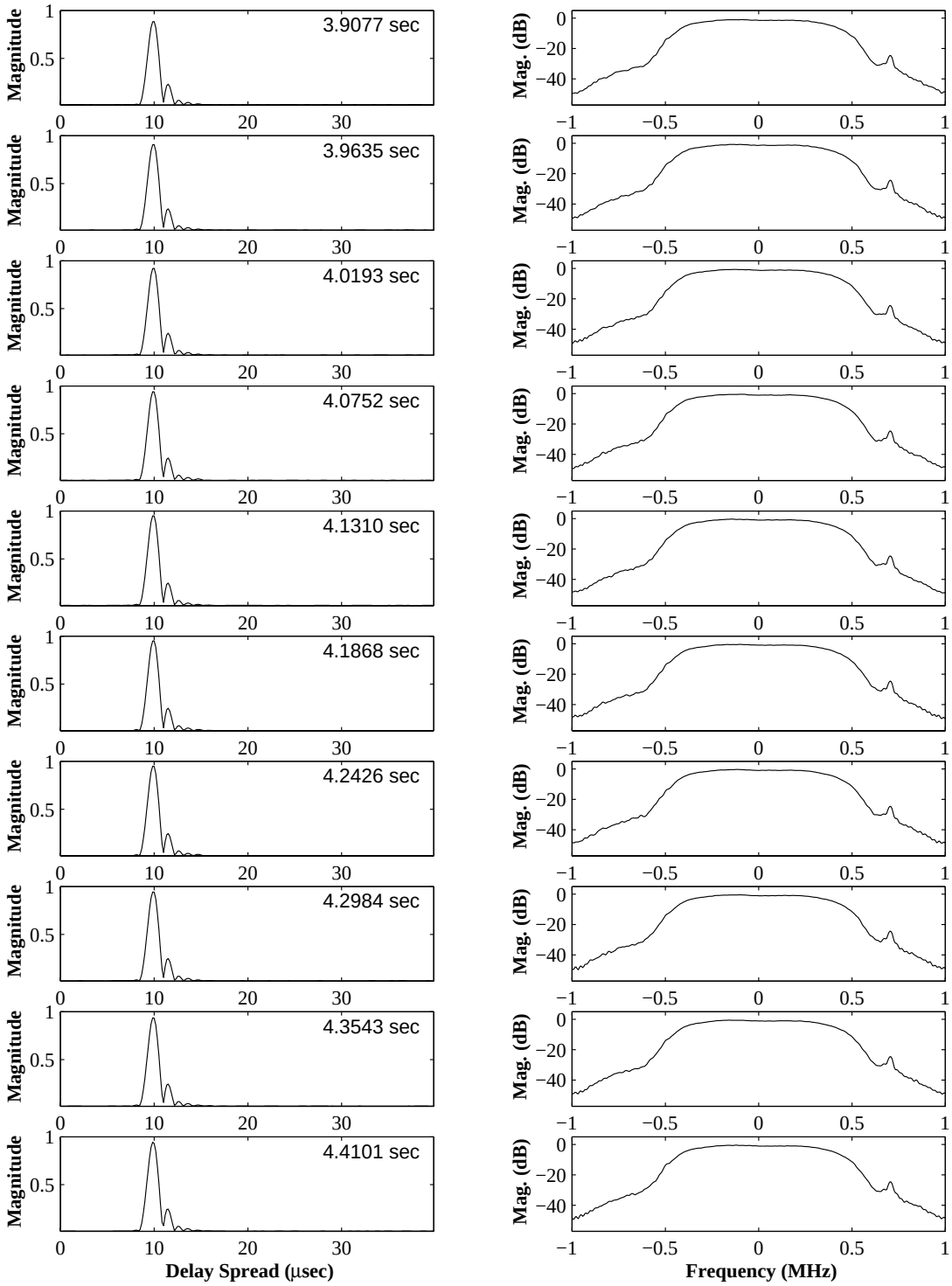

Figure 3.110: Local power delay profiles for ship21jan1936 (8).

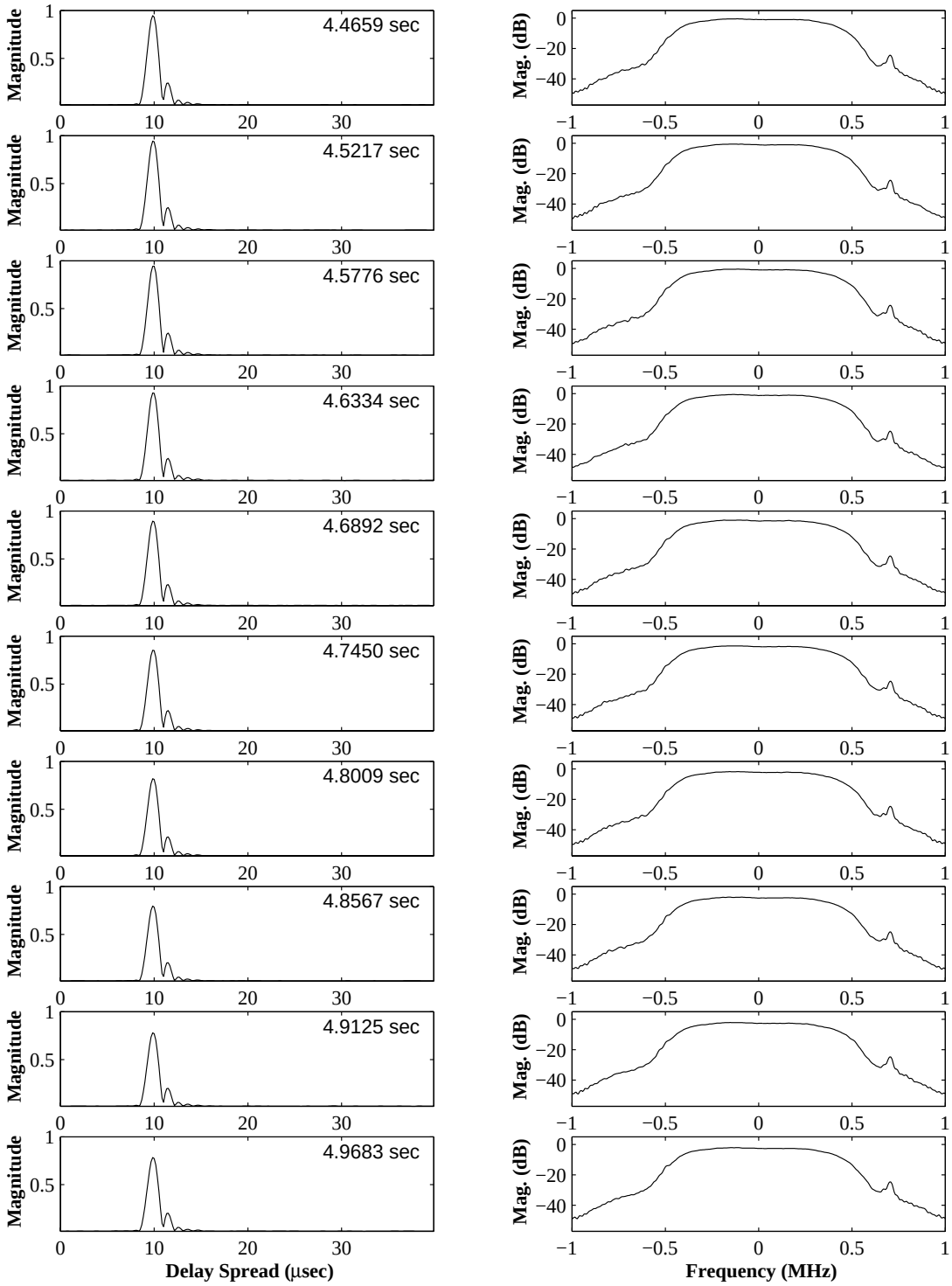

Figure 3.111: Local power delay profiles for ship21jan1936 (9).

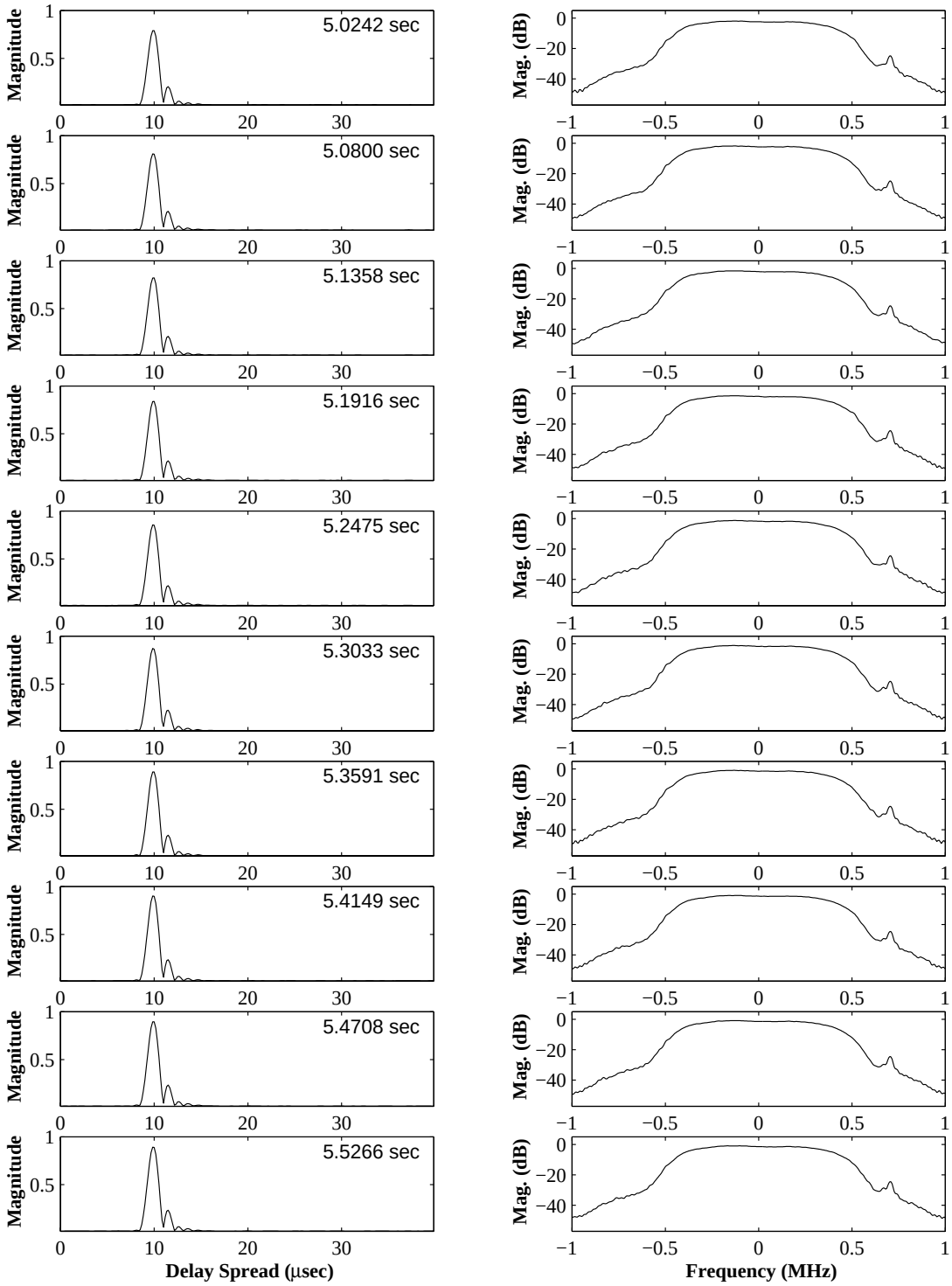

Figure 3.112: Local power delay profiles for ship21jan1936 (10).

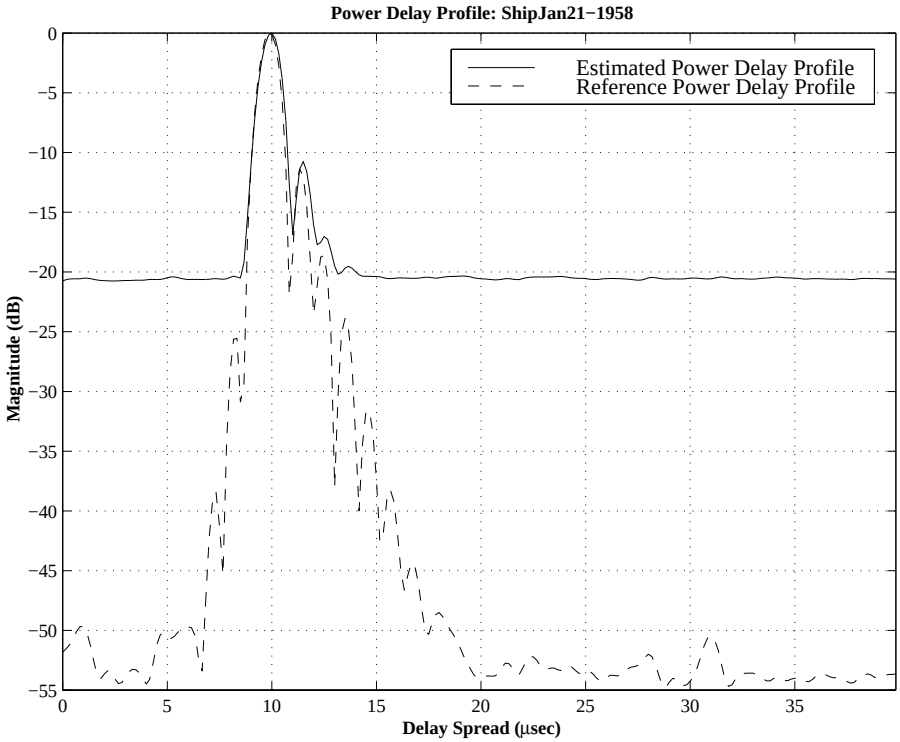

Figure 3.113: Power delay profile for ship21jan1958.

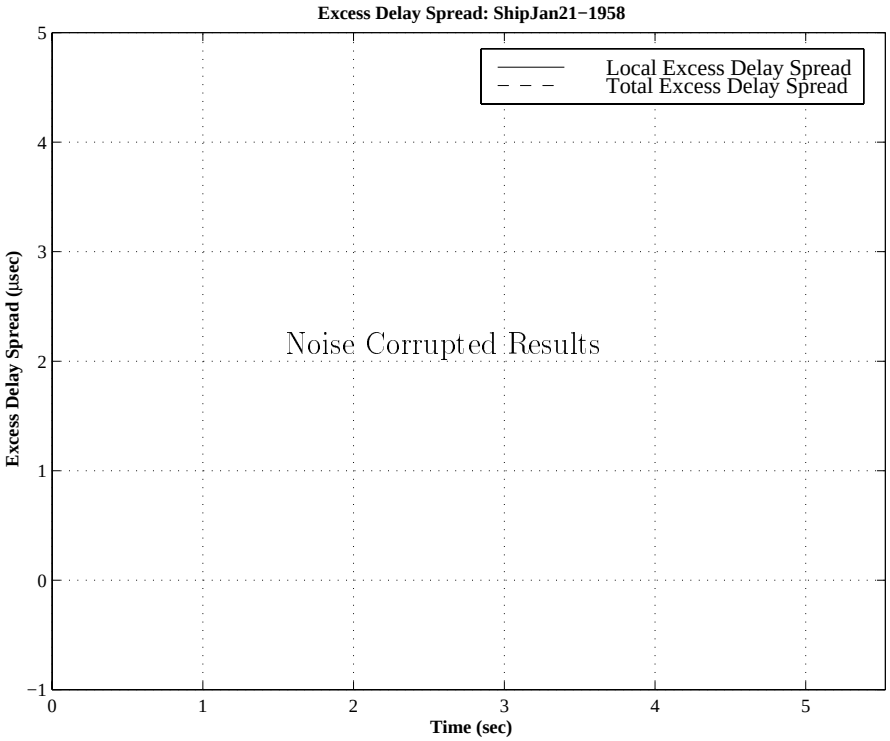

Figure 3.114: Excess delay spread for ship21jan1958.

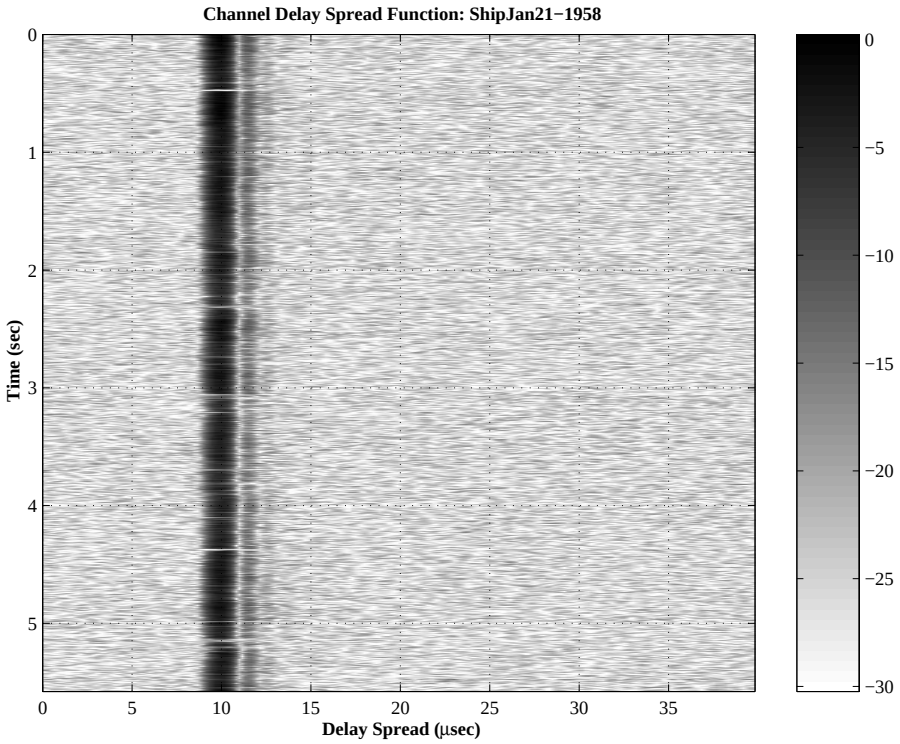

Figure 3.115: Channel delay spread function for ship21jan1958.

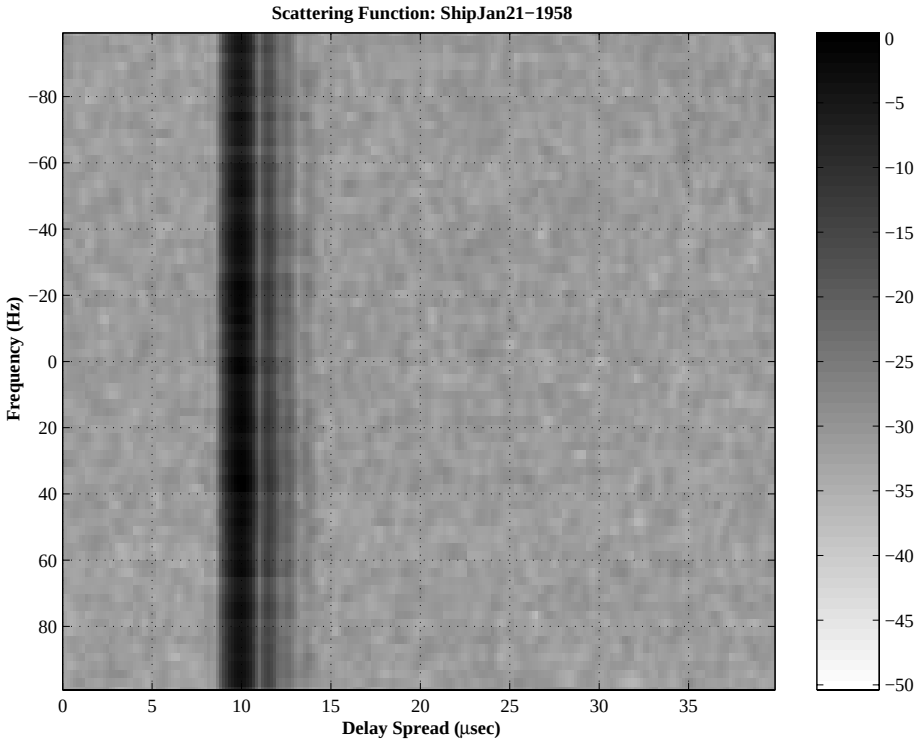

Figure 3.116: Scattering function for ship21jan1958.

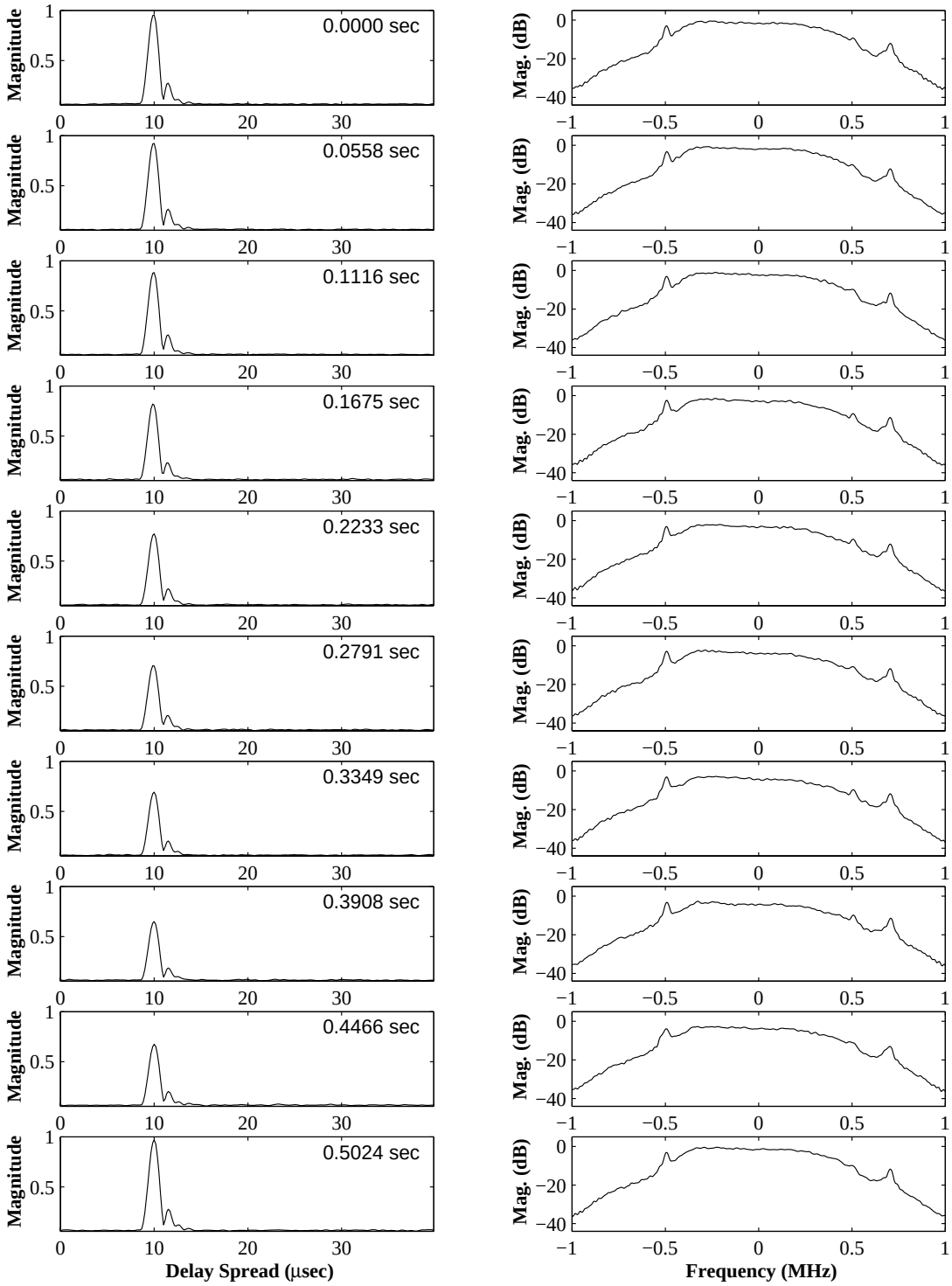

Figure 3.117: Local power delay profiles for ship21jan1958 (1).

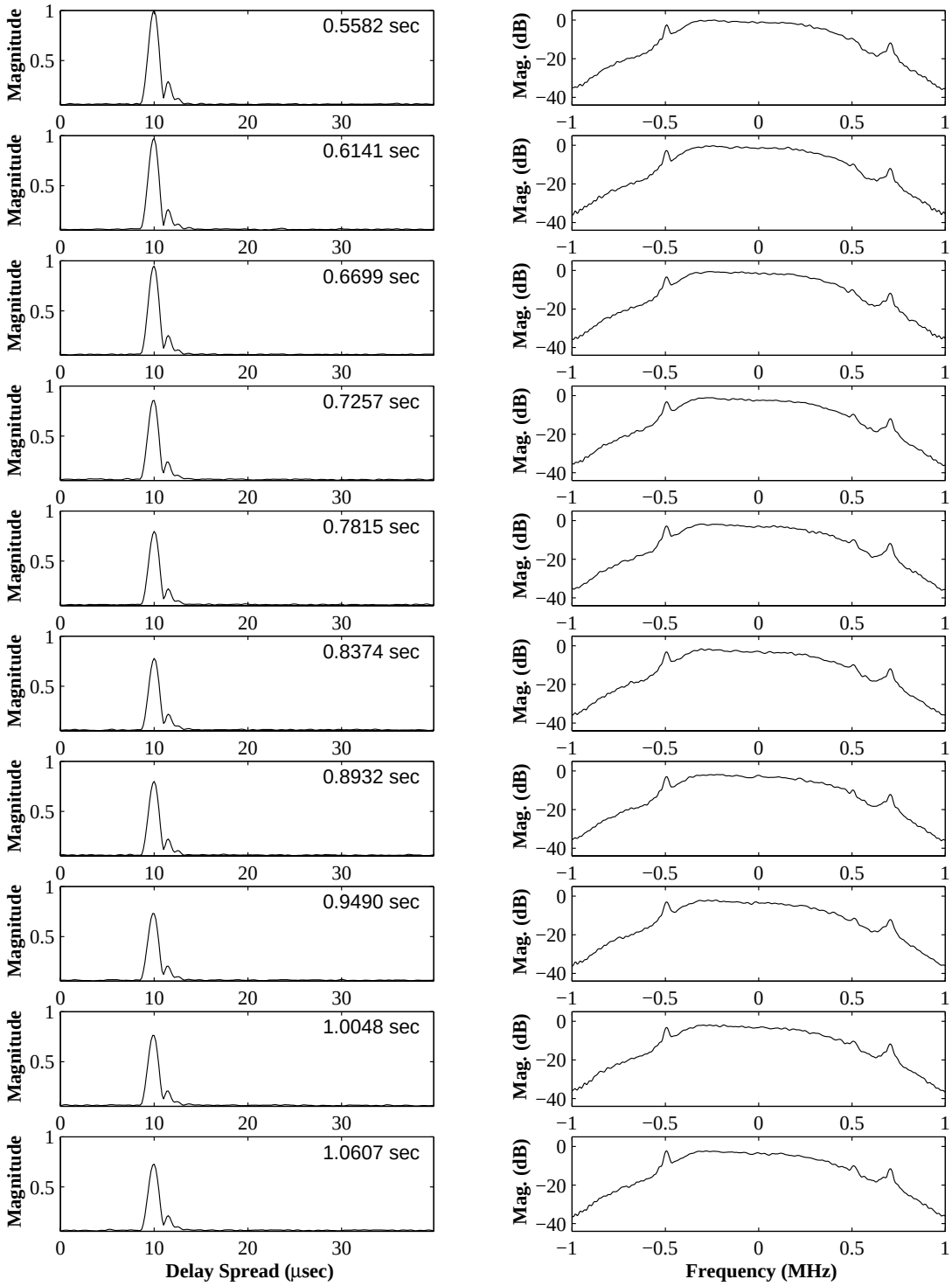

Figure 3.118: Local power delay profiles for ship21jan1958 (2).

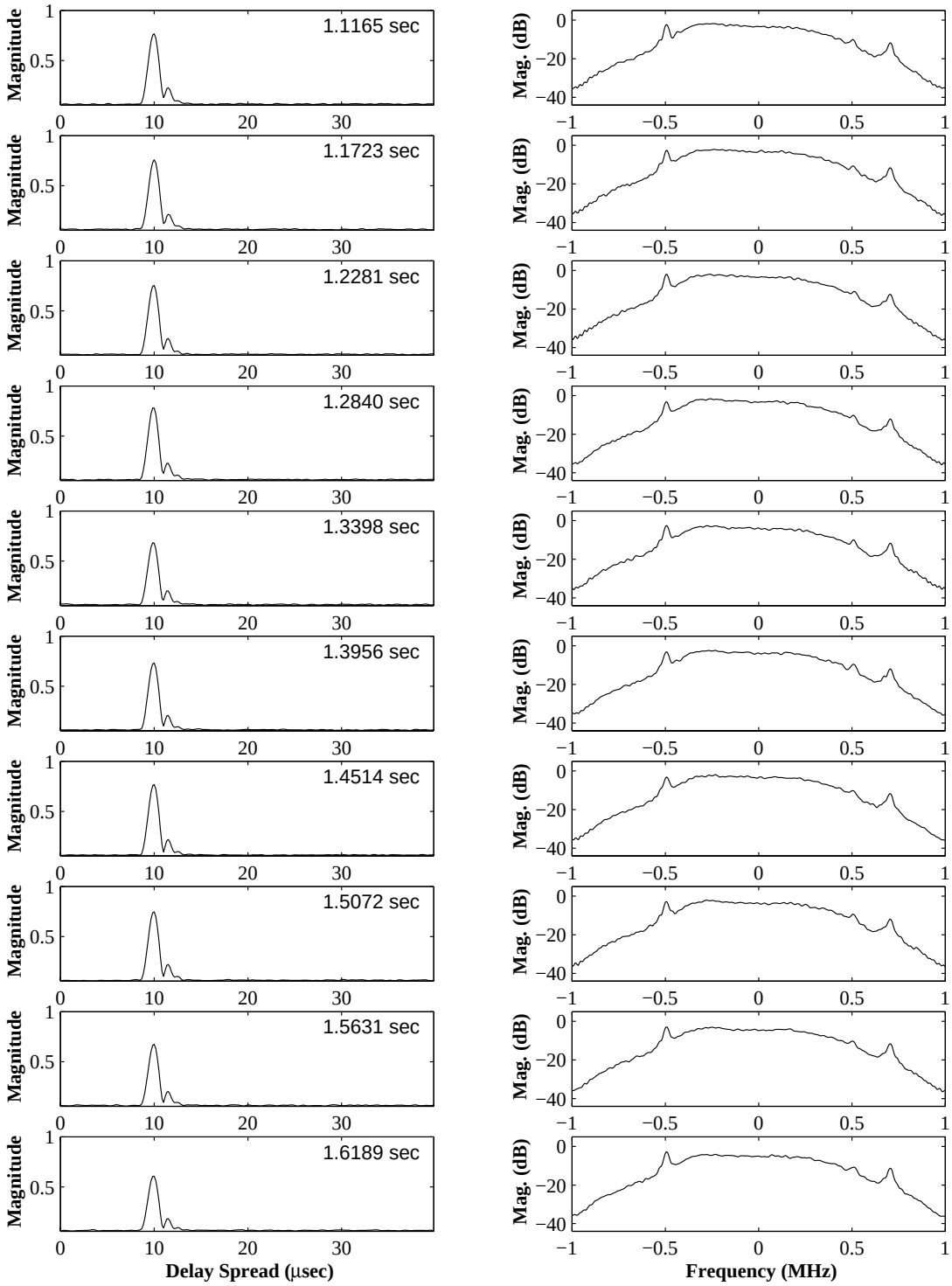

Figure 3.119: Local power delay profiles for ship21jan1958 (3).

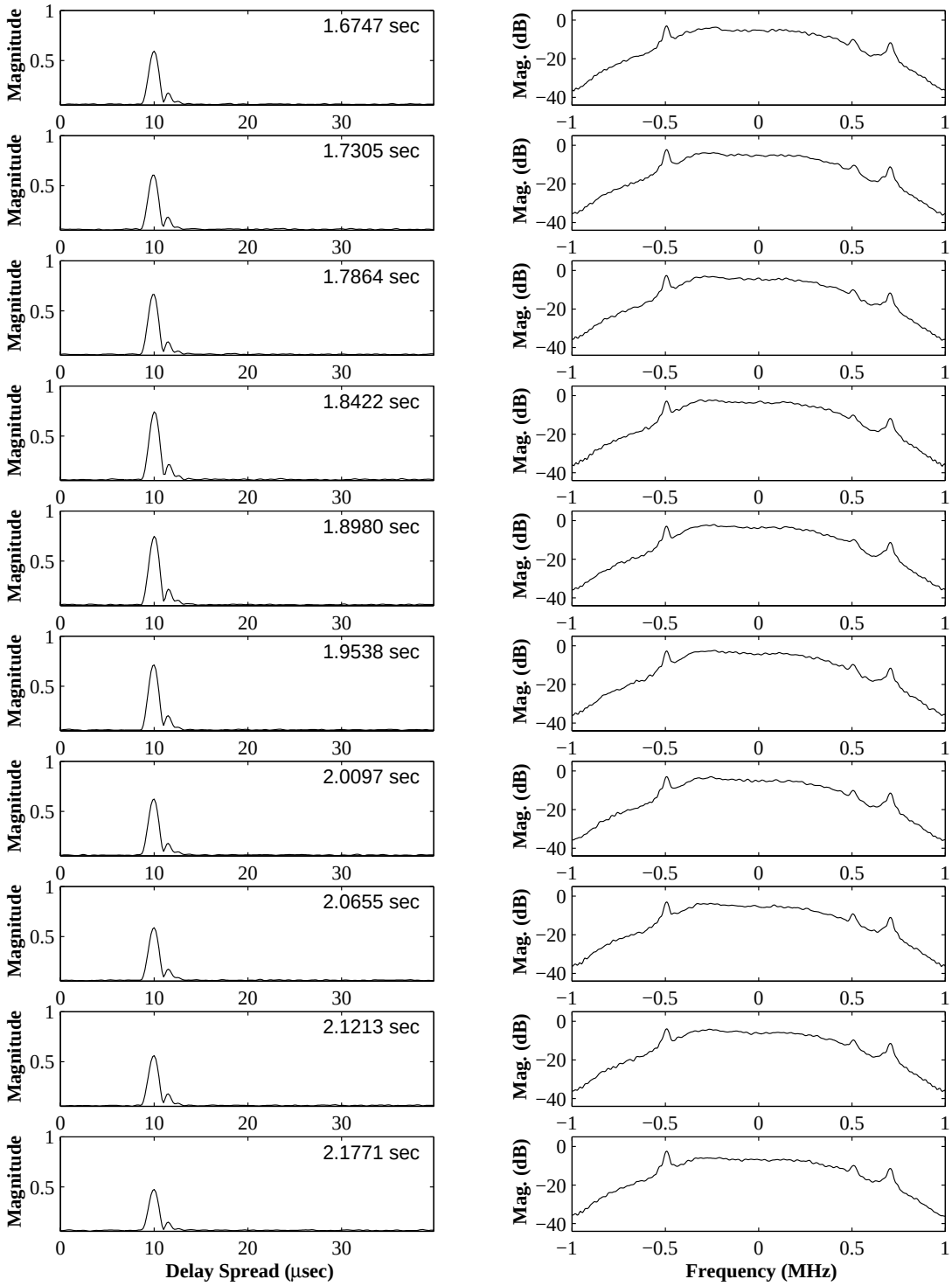

Figure 3.120: Local power delay profiles for ship21jan1958 (4).

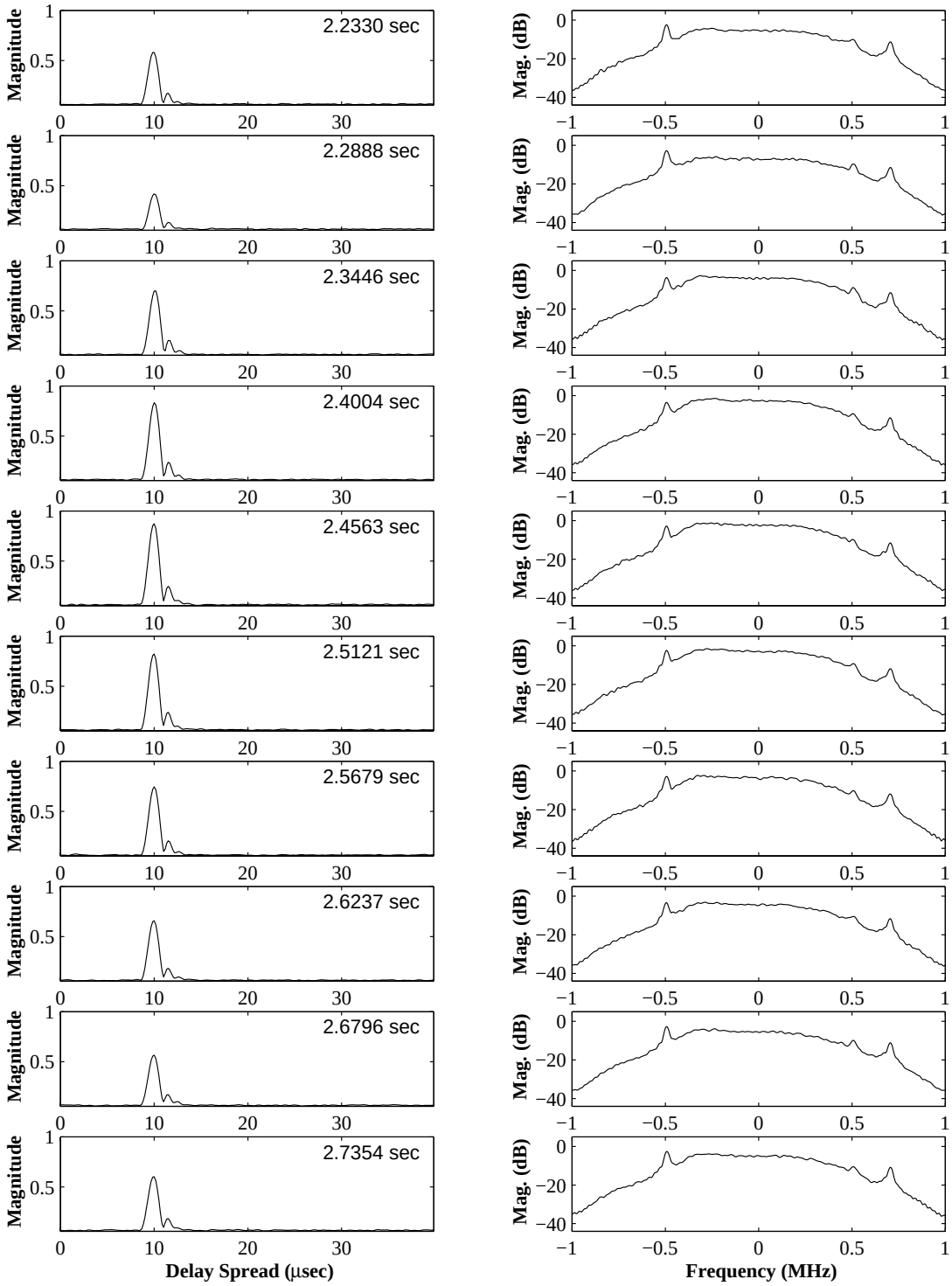

Figure 3.121: Local power delay profiles for ship21jan1958 (5).

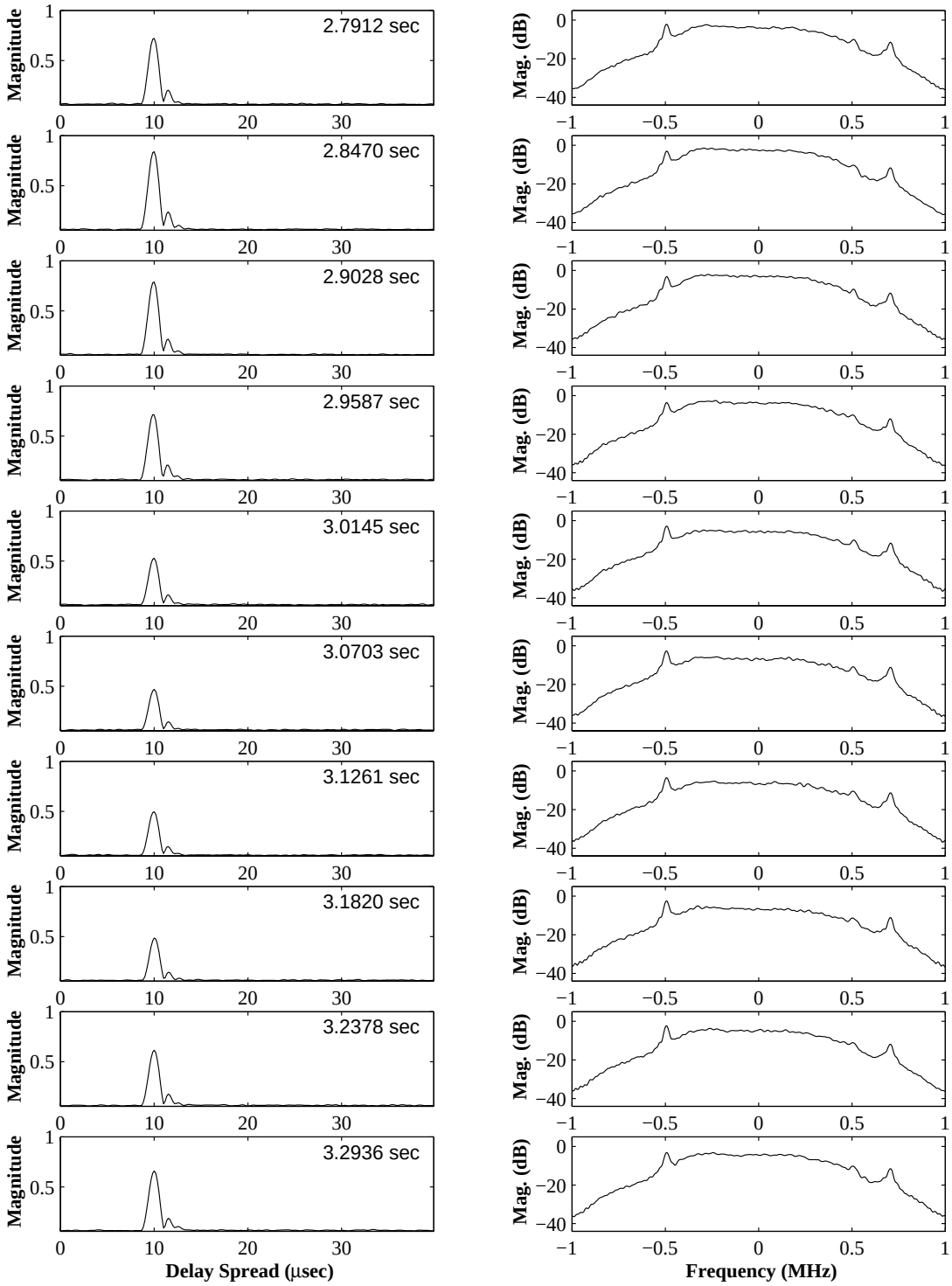

Figure 3.122: Local power delay profiles for ship21jan1958 (6).

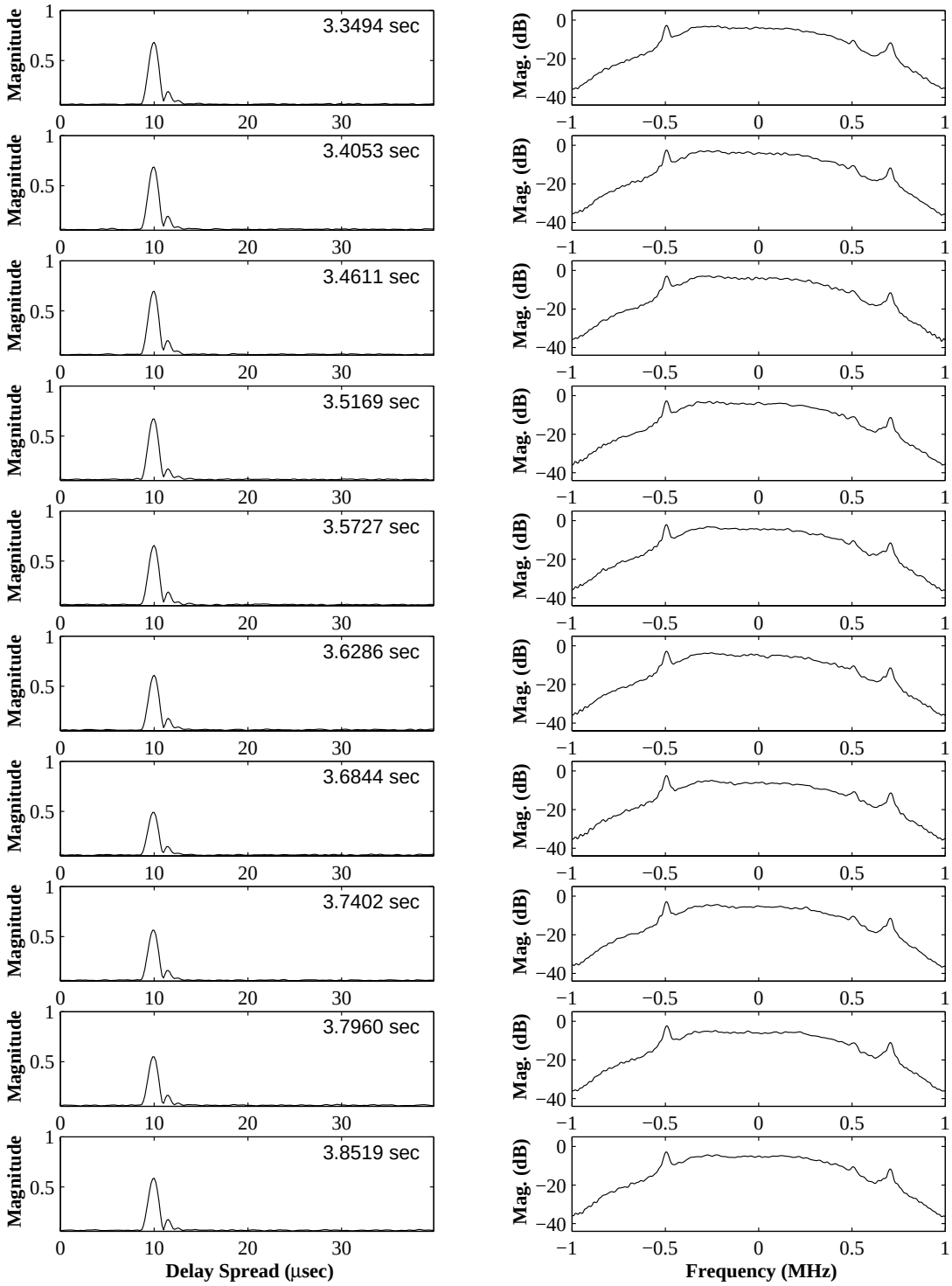

Figure 3.123: Local power delay profiles for ship21jan1958 (7).

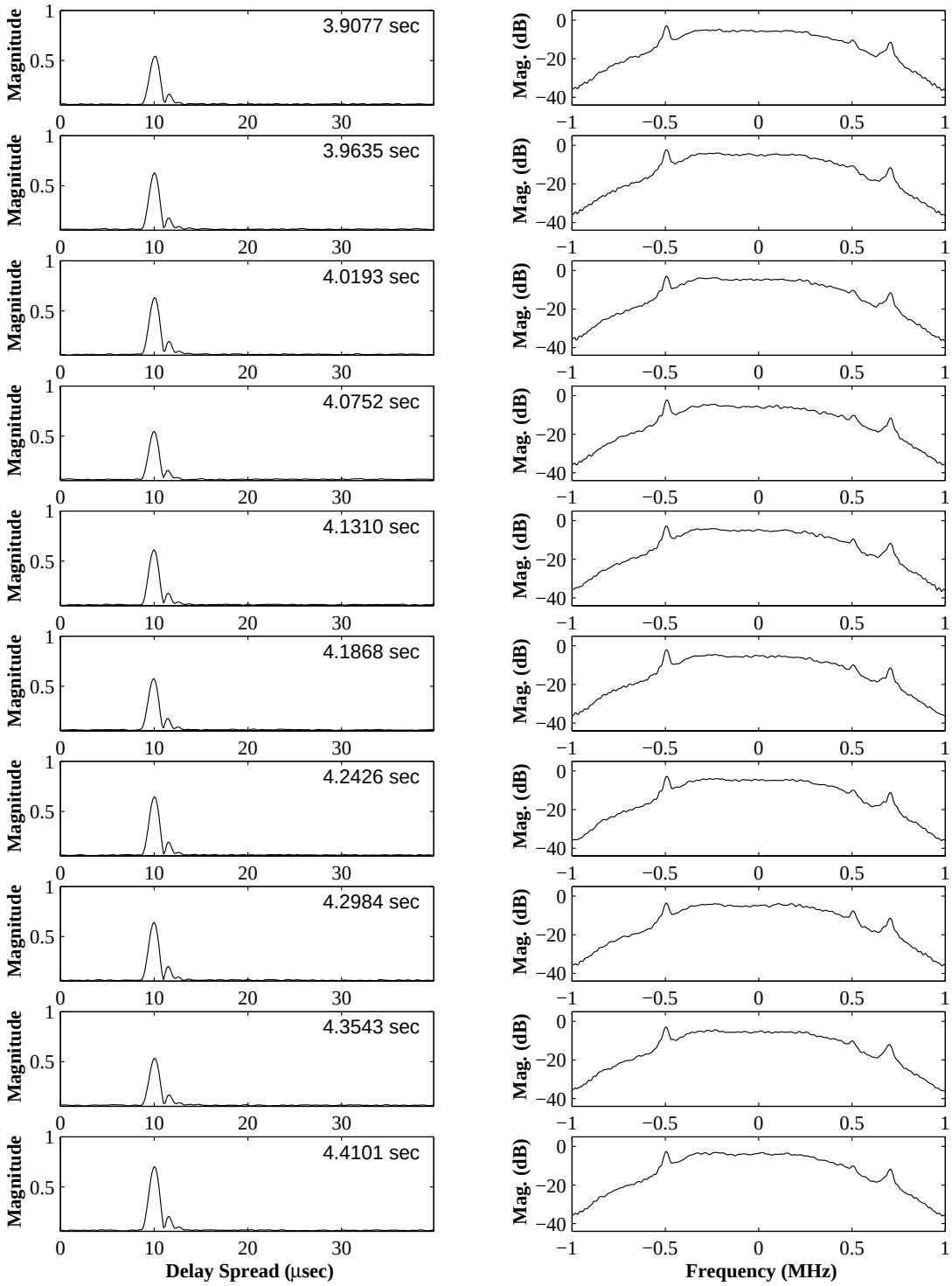

Figure 3.124: Local power delay profiles for ship21jan1958 (8).

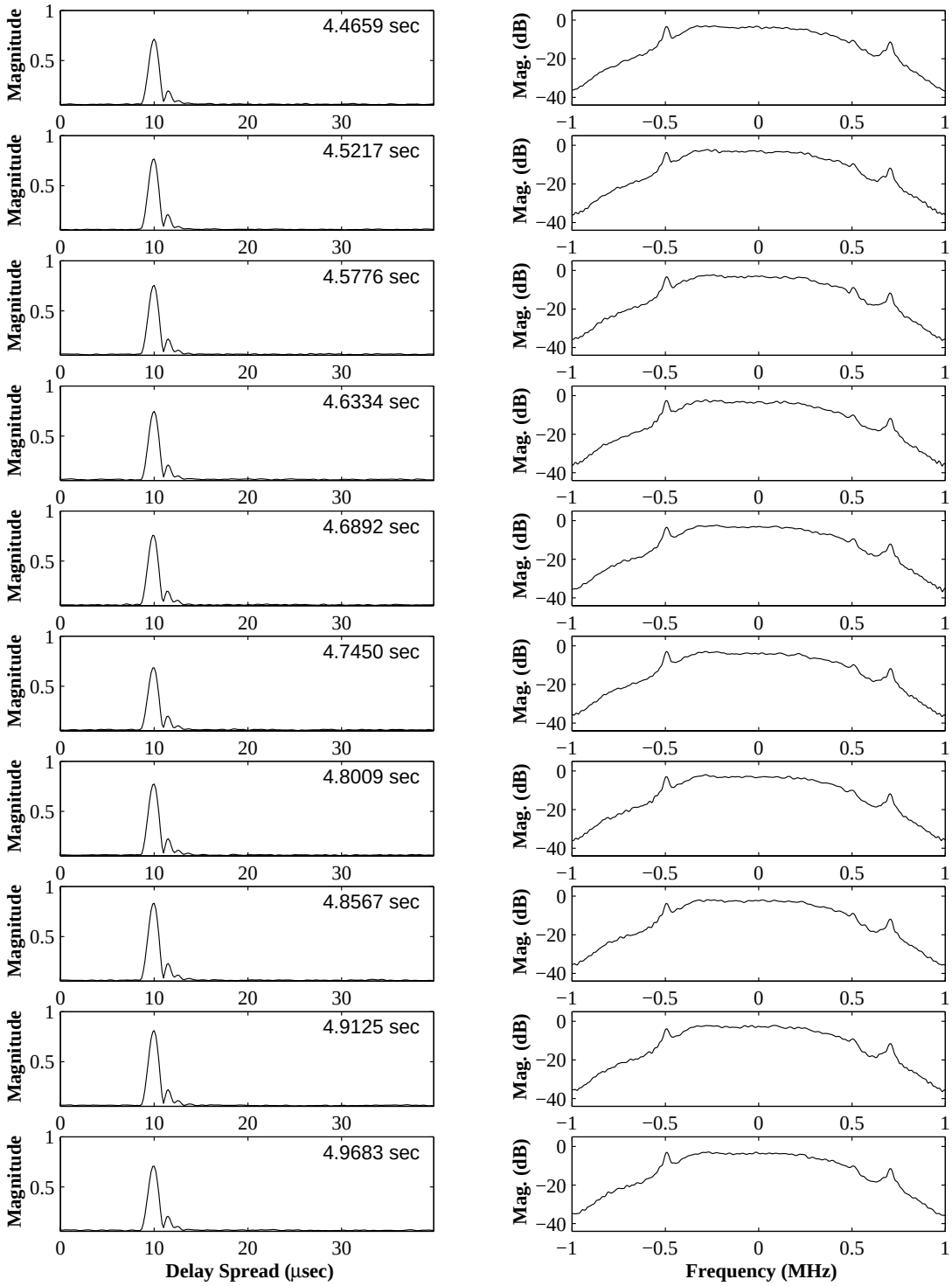

Figure 3.125: Local power delay profiles for ship21jan1958 (9).

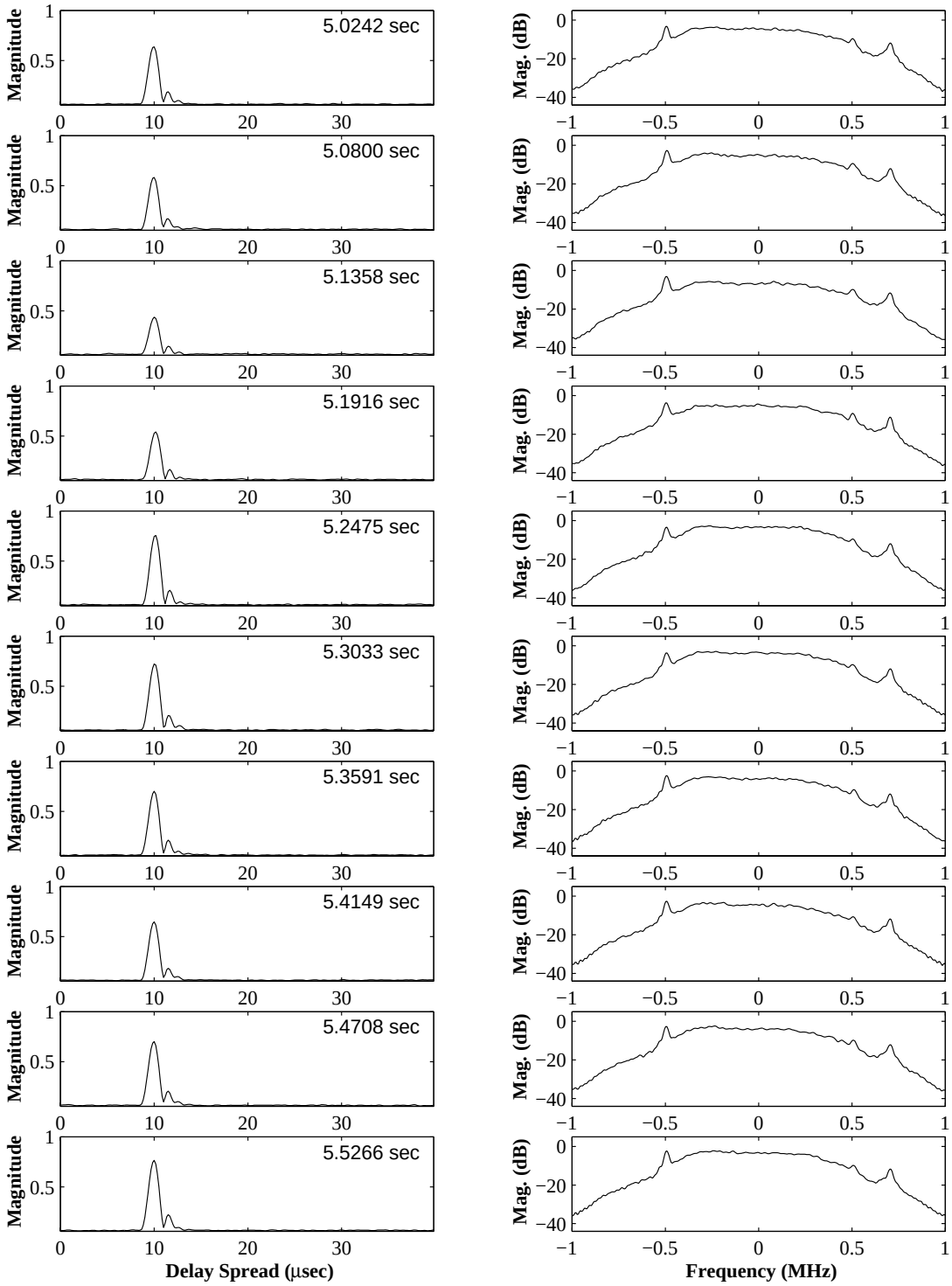

Figure 3.126: Local power delay profiles for ship21jan1958 (10).

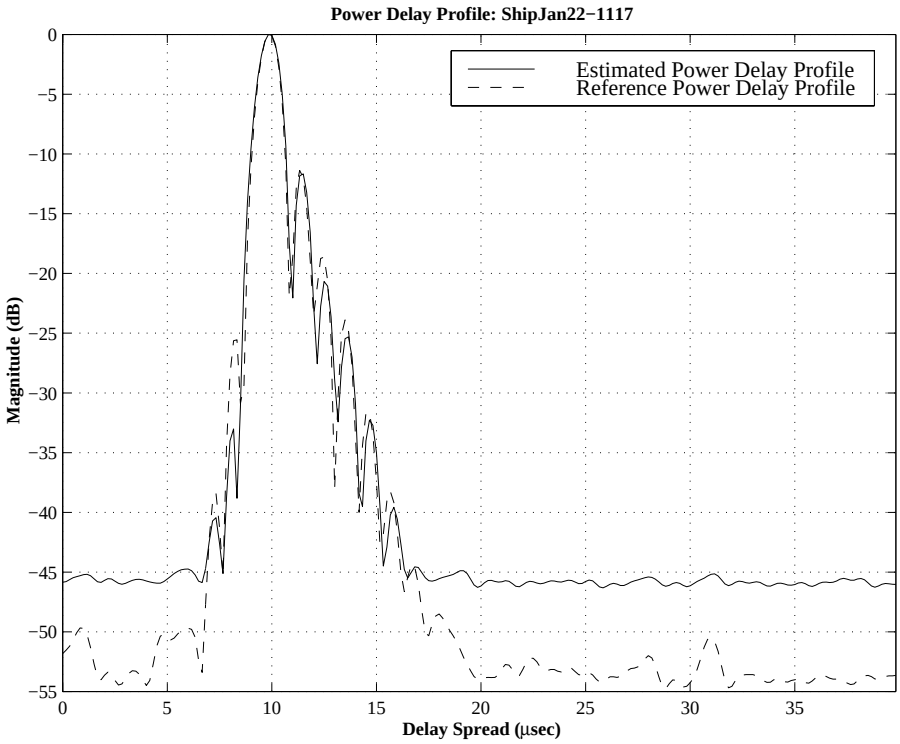

Figure 3.127: Power delay profile for ship22jan1117.

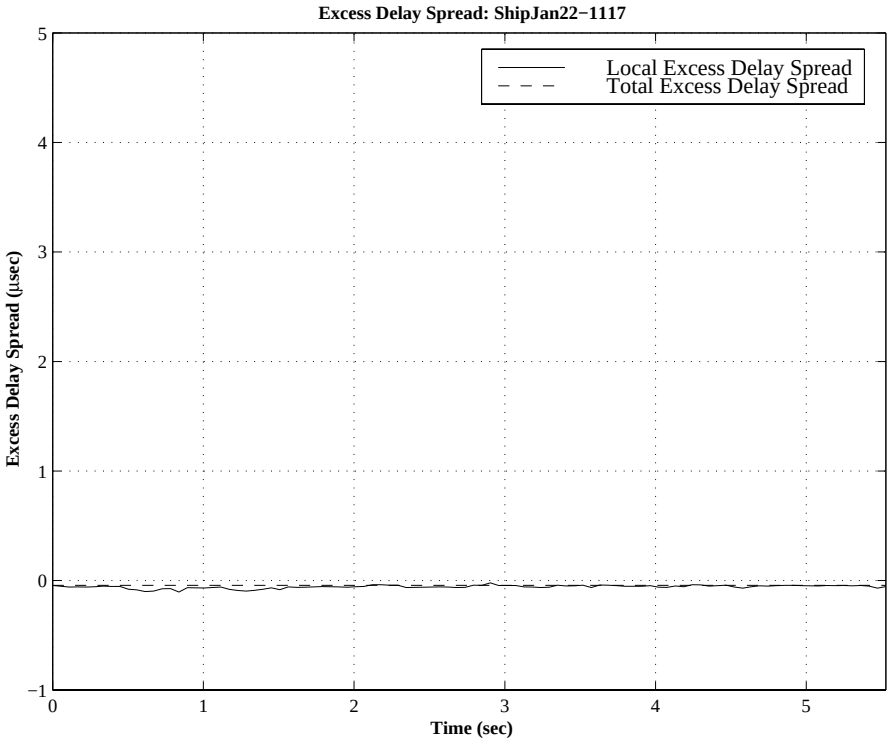

Figure 3.128: Excess delay spread for ship22jan1117.

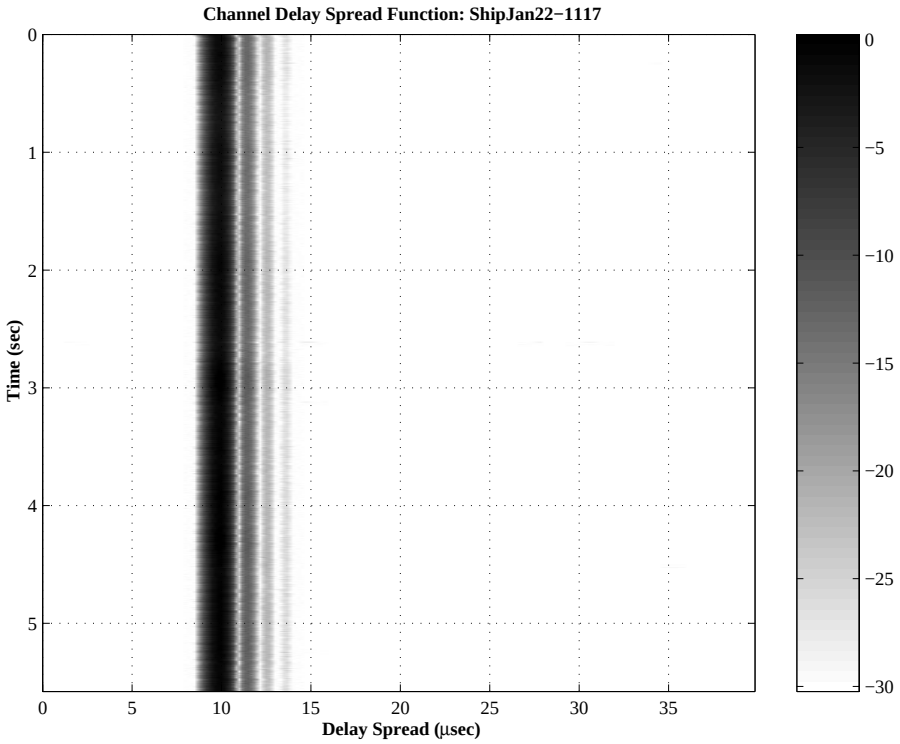

Figure 3.129: Channel delay spread function for ship22jan1117.

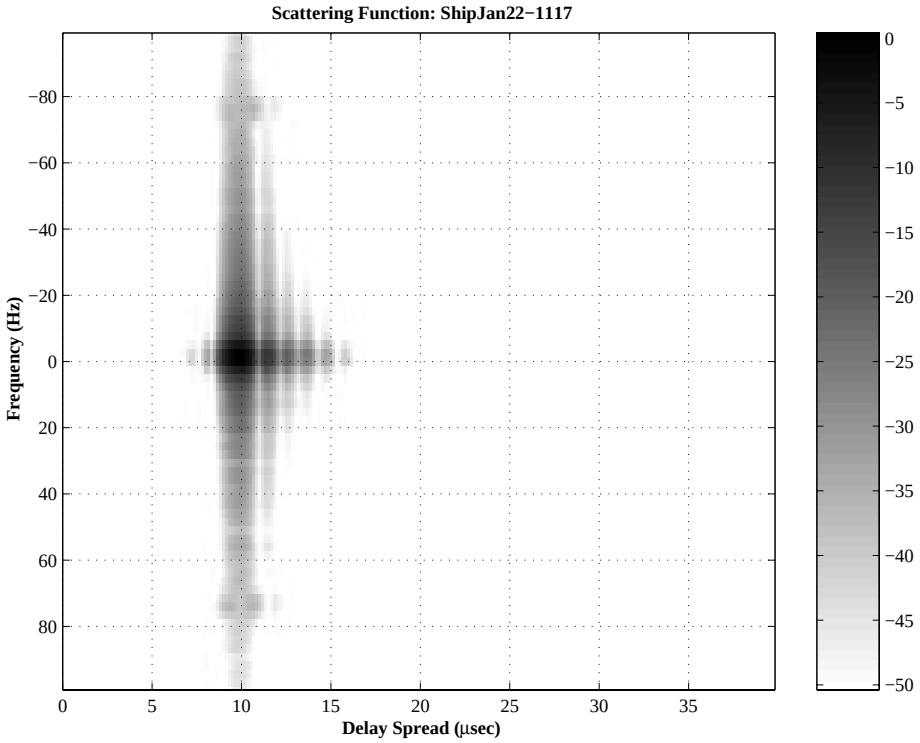

Figure 3.130: Scattering function for ship22jan1117.

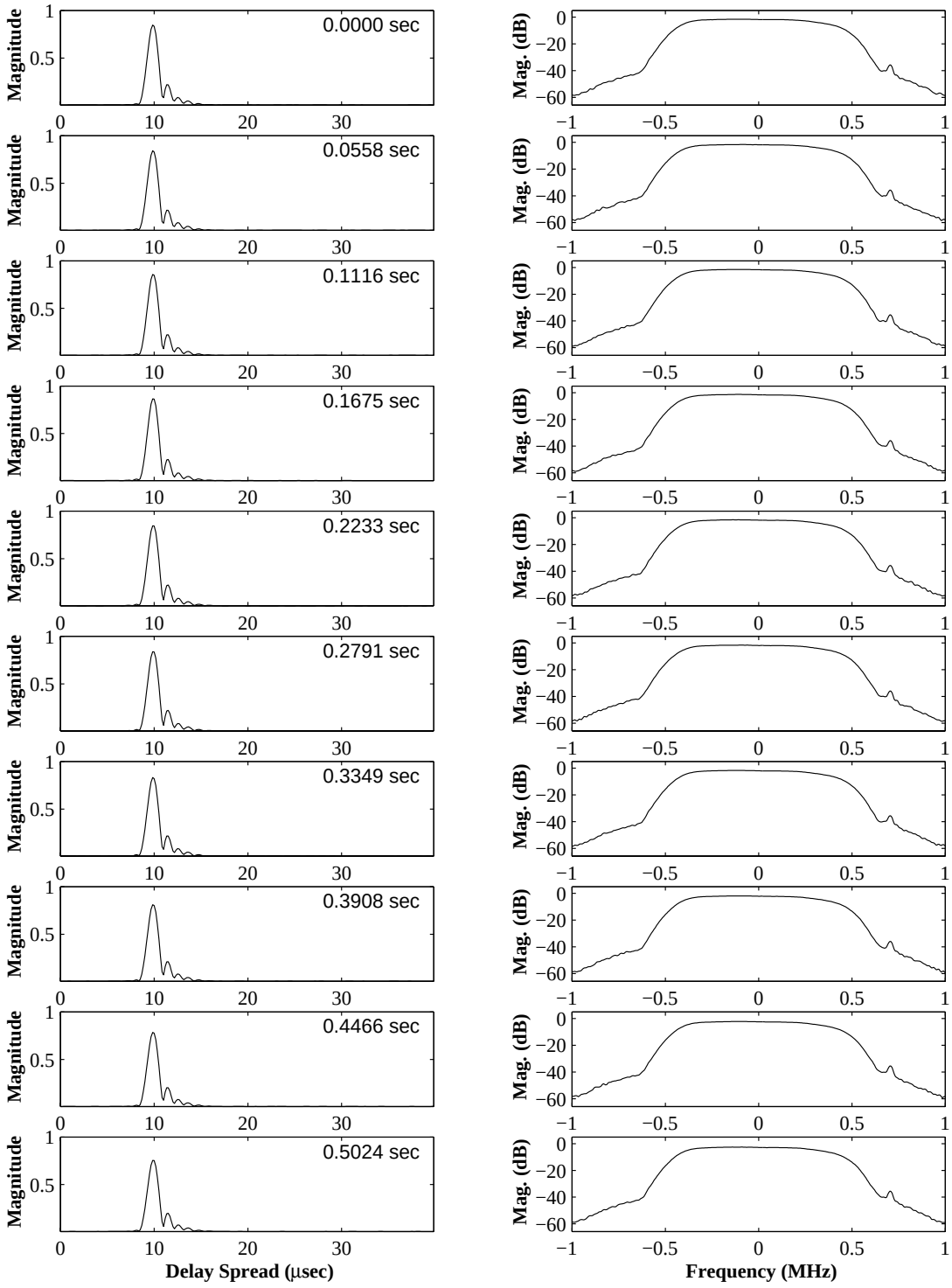

Figure 3.131: Local power delay profiles for ship22jan1117 (1).

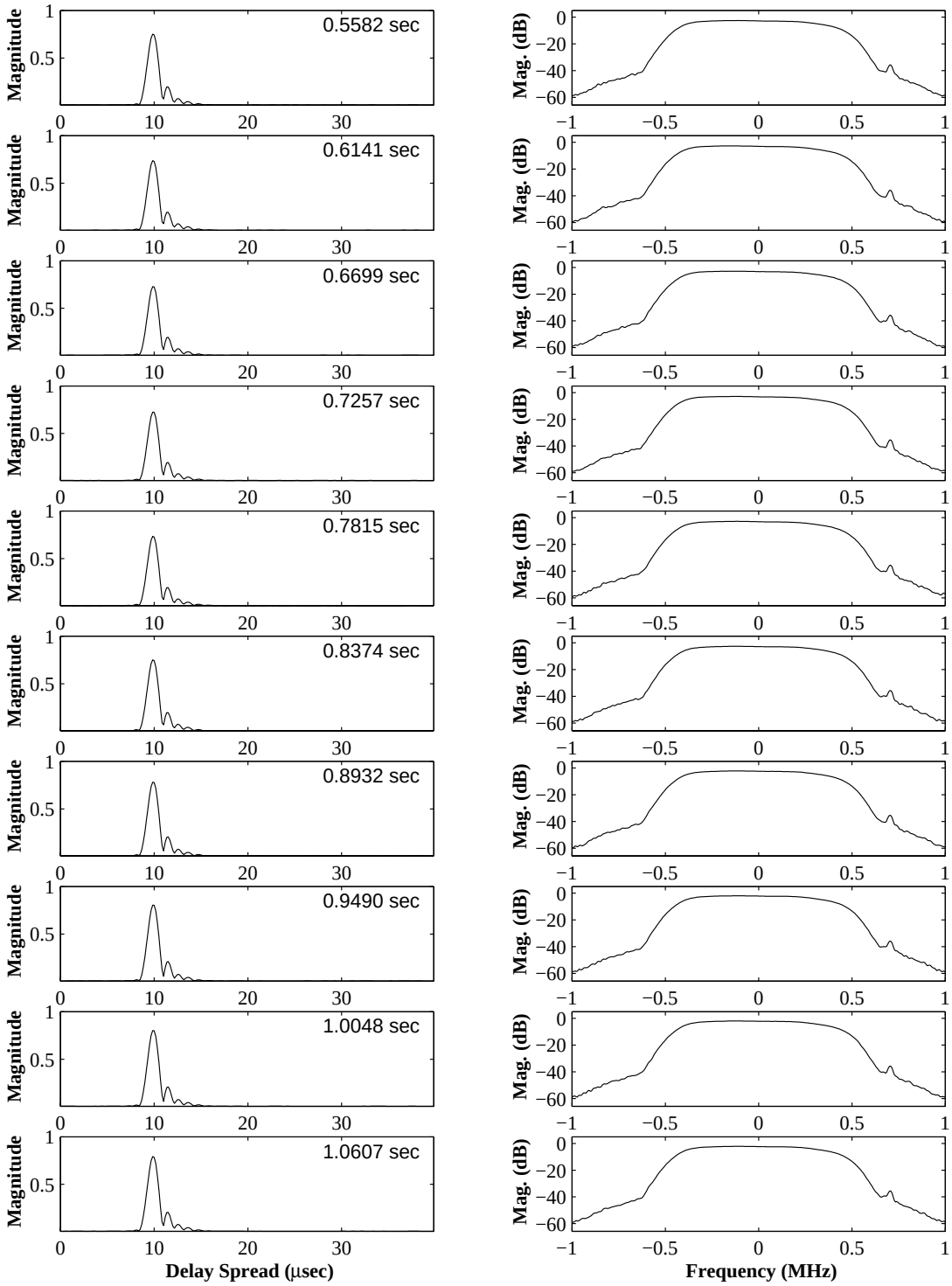

Figure 3.132: Local power delay profiles for ship22jan1117 (2).

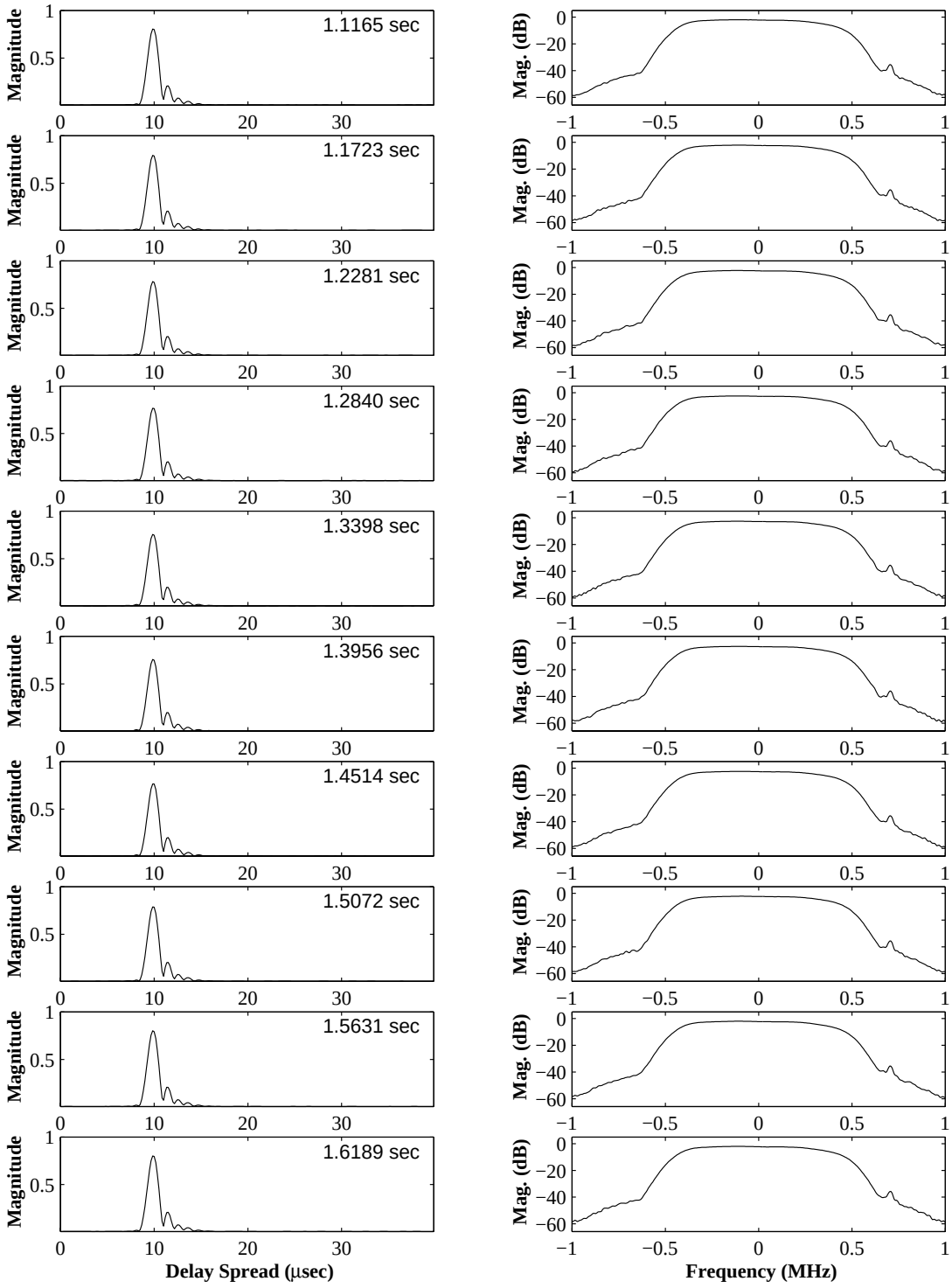

Figure 3.133: Local power delay profiles for ship22jan1117 (3).

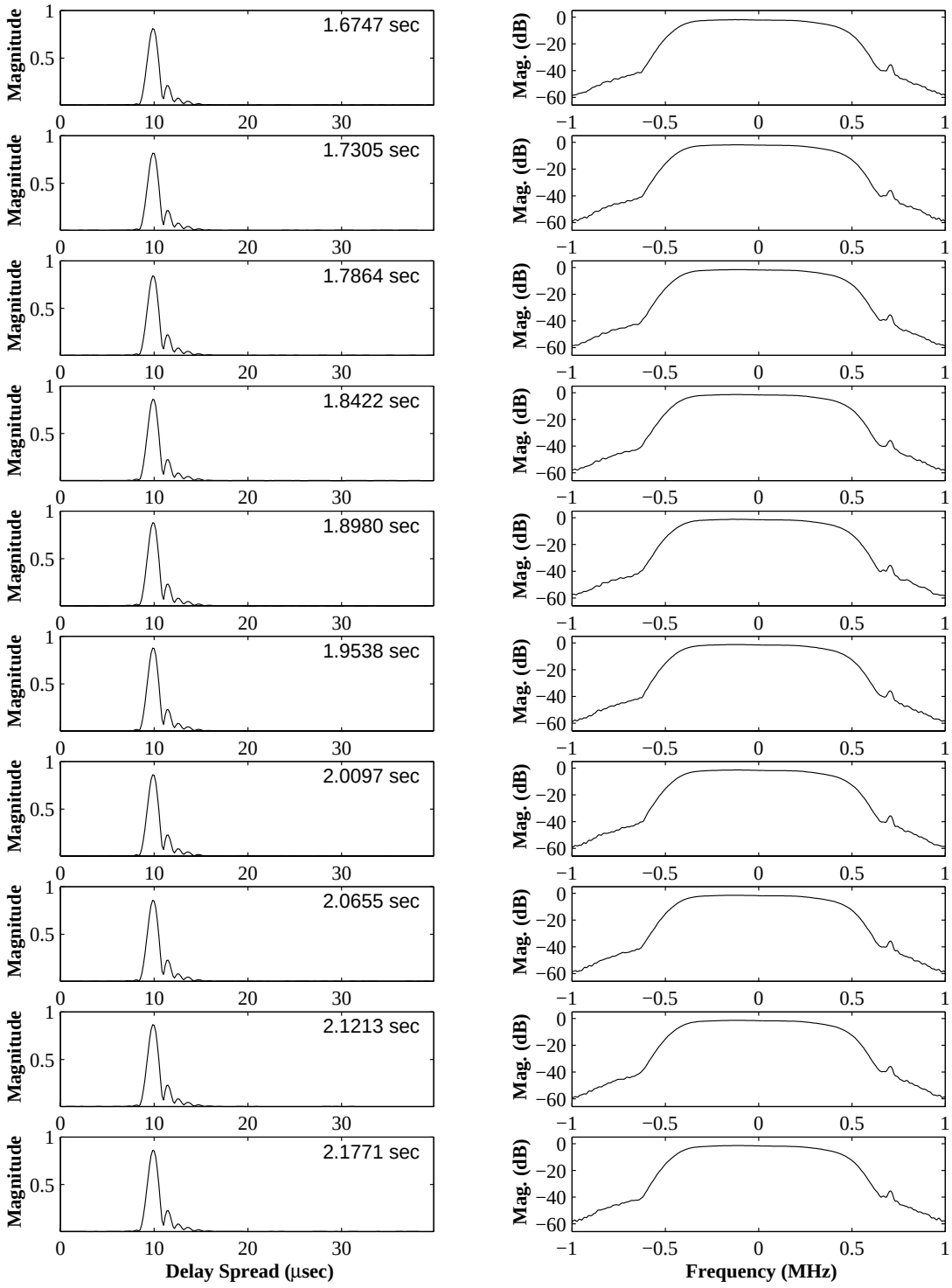

Figure 3.134: Local power delay profiles for ship22jan1117 (4).

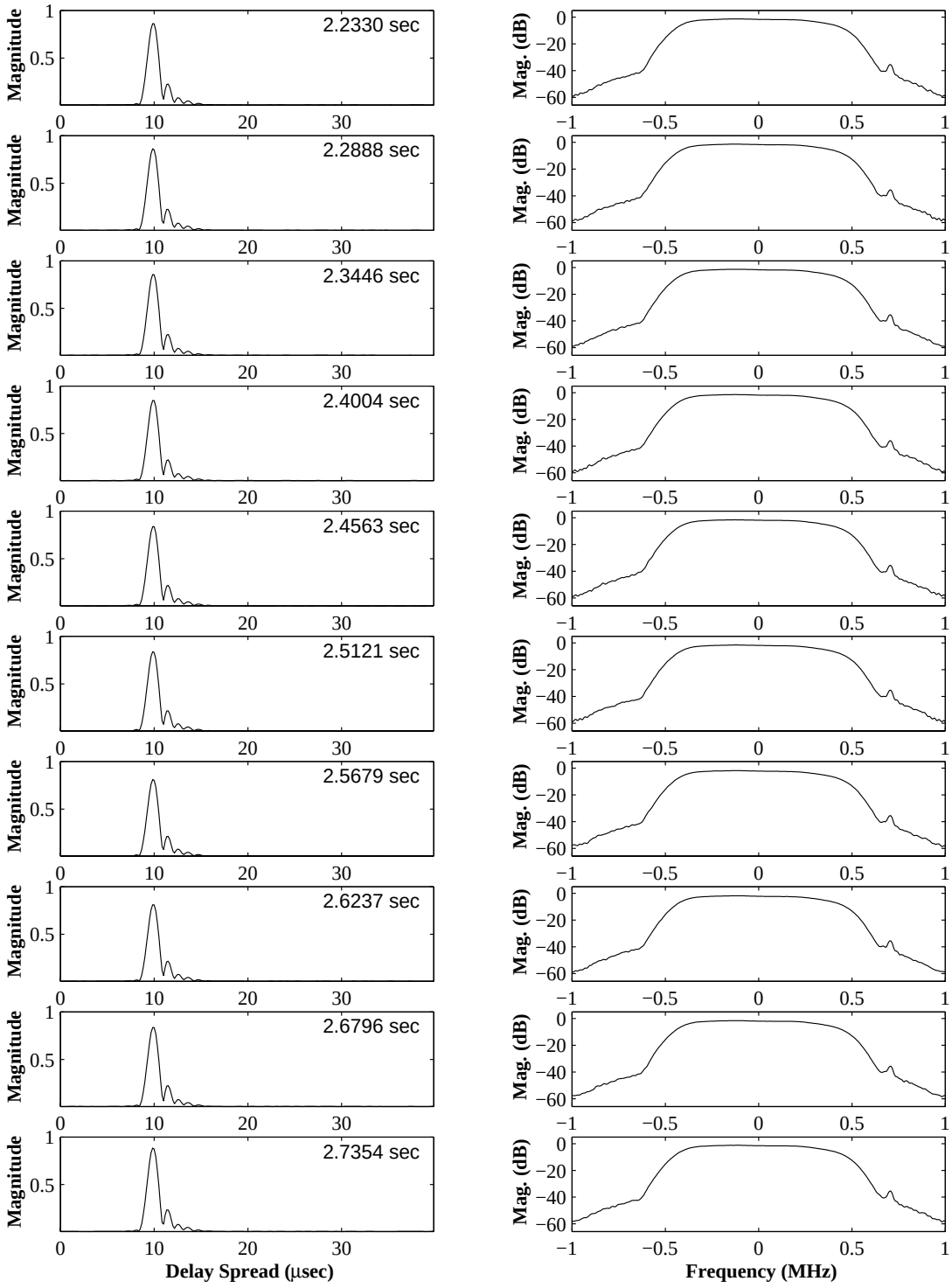

Figure 3.135: Local power delay profiles for ship22jan1117 (5).

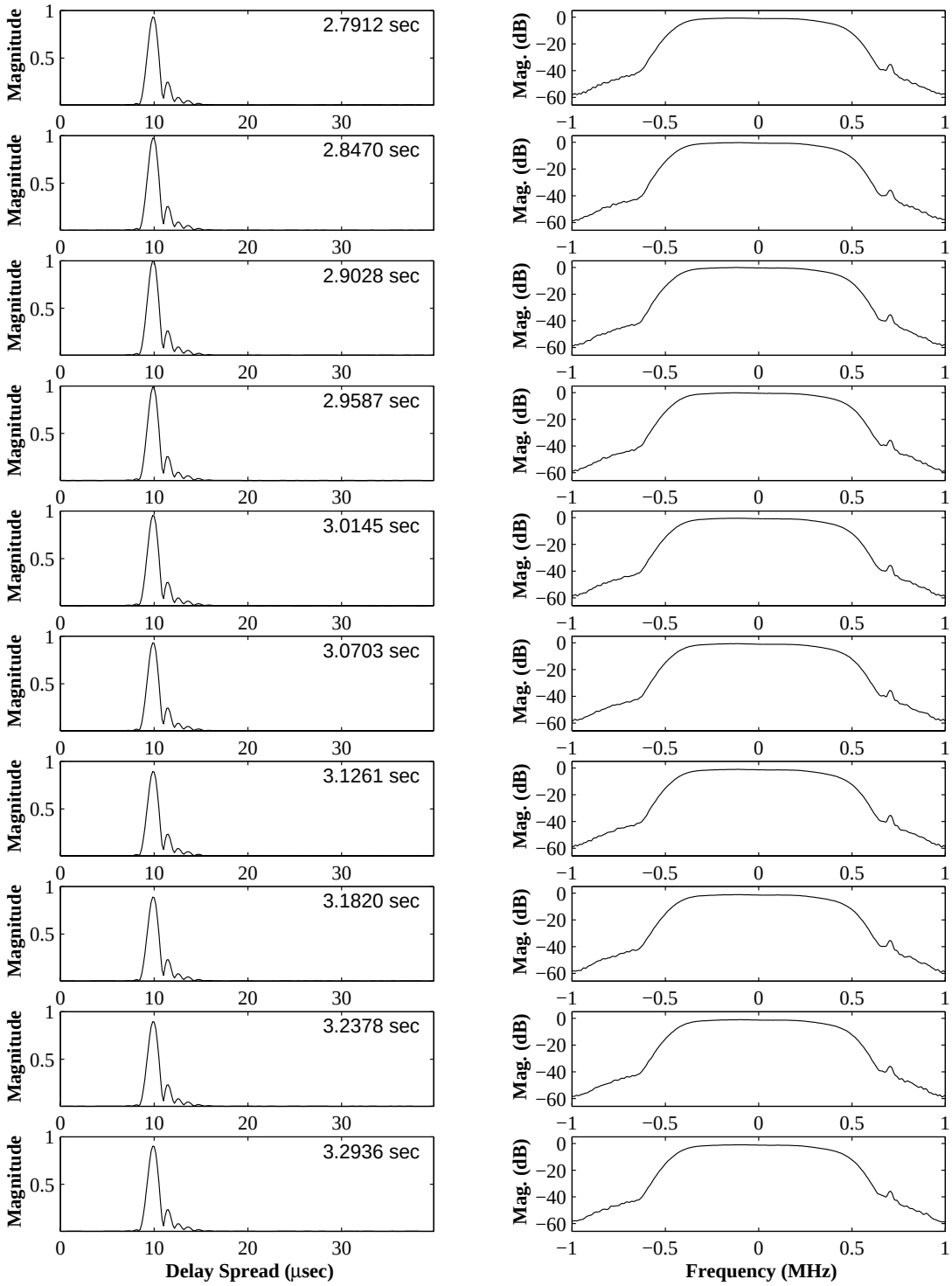

Figure 3.136: Local power delay profiles for ship22jan1117 (6).

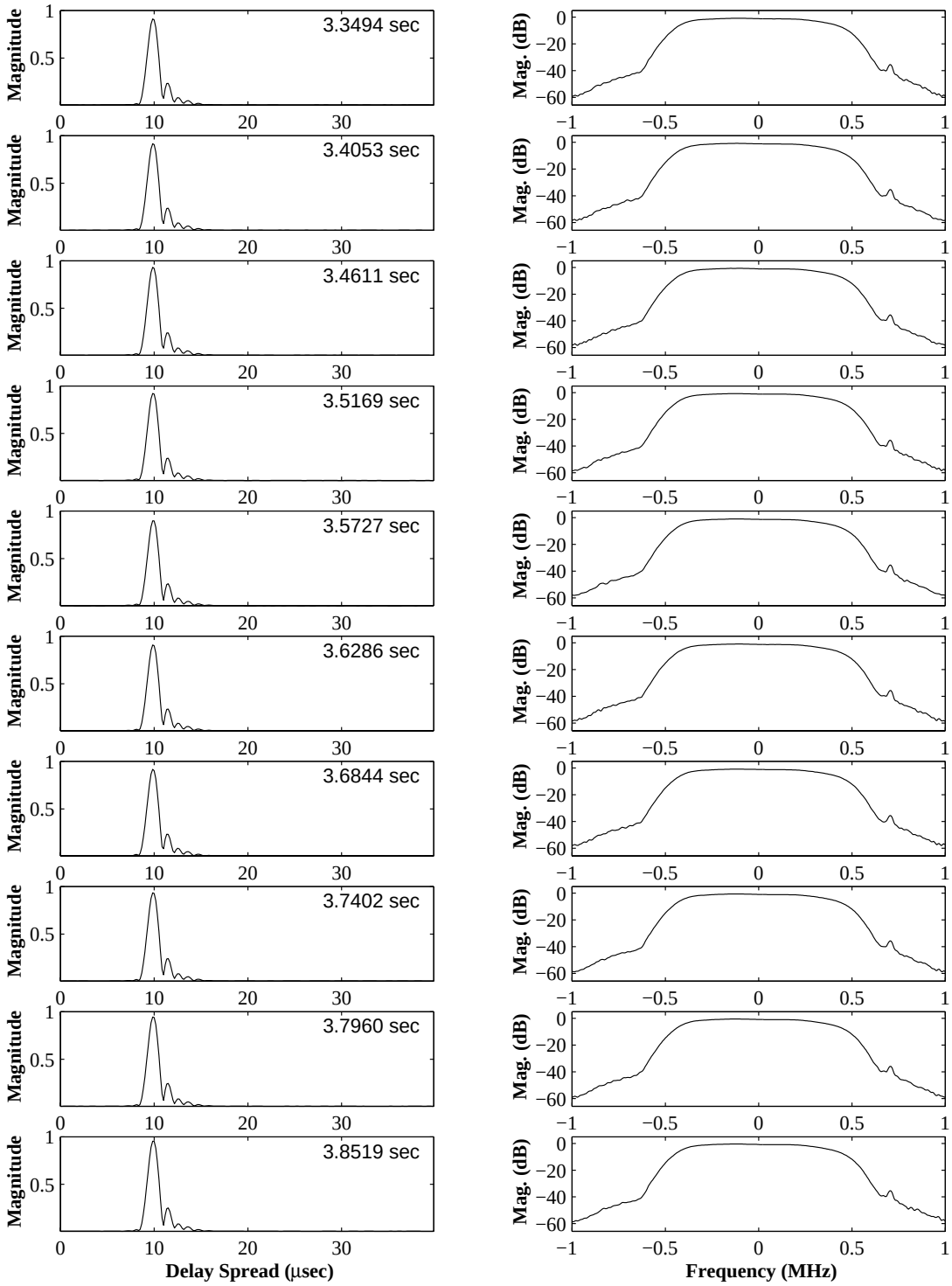

Figure 3.137: Local power delay profiles for ship22jan1117 (7).

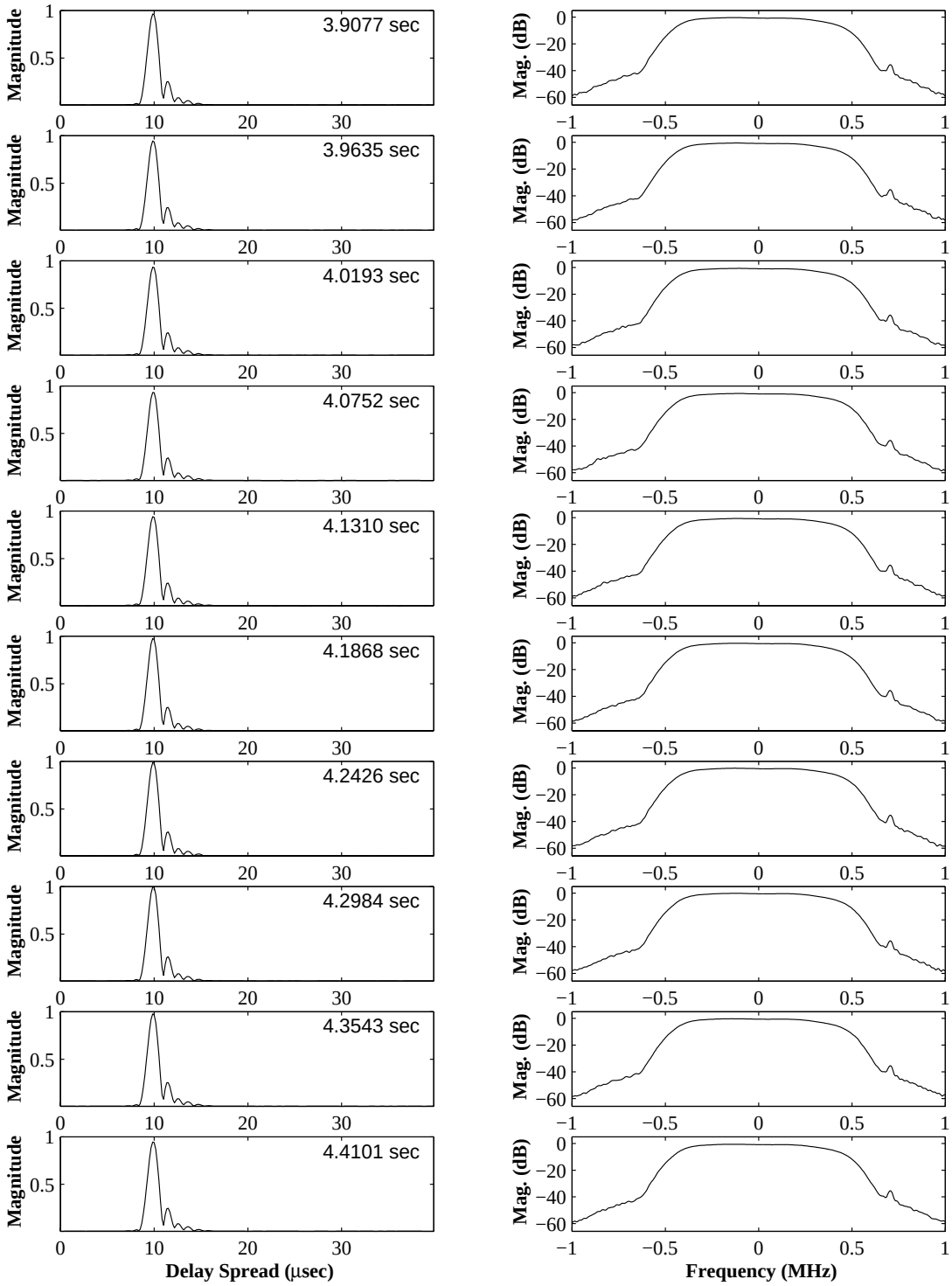

Figure 3.138: Local power delay profiles for ship22jan1117 (8).

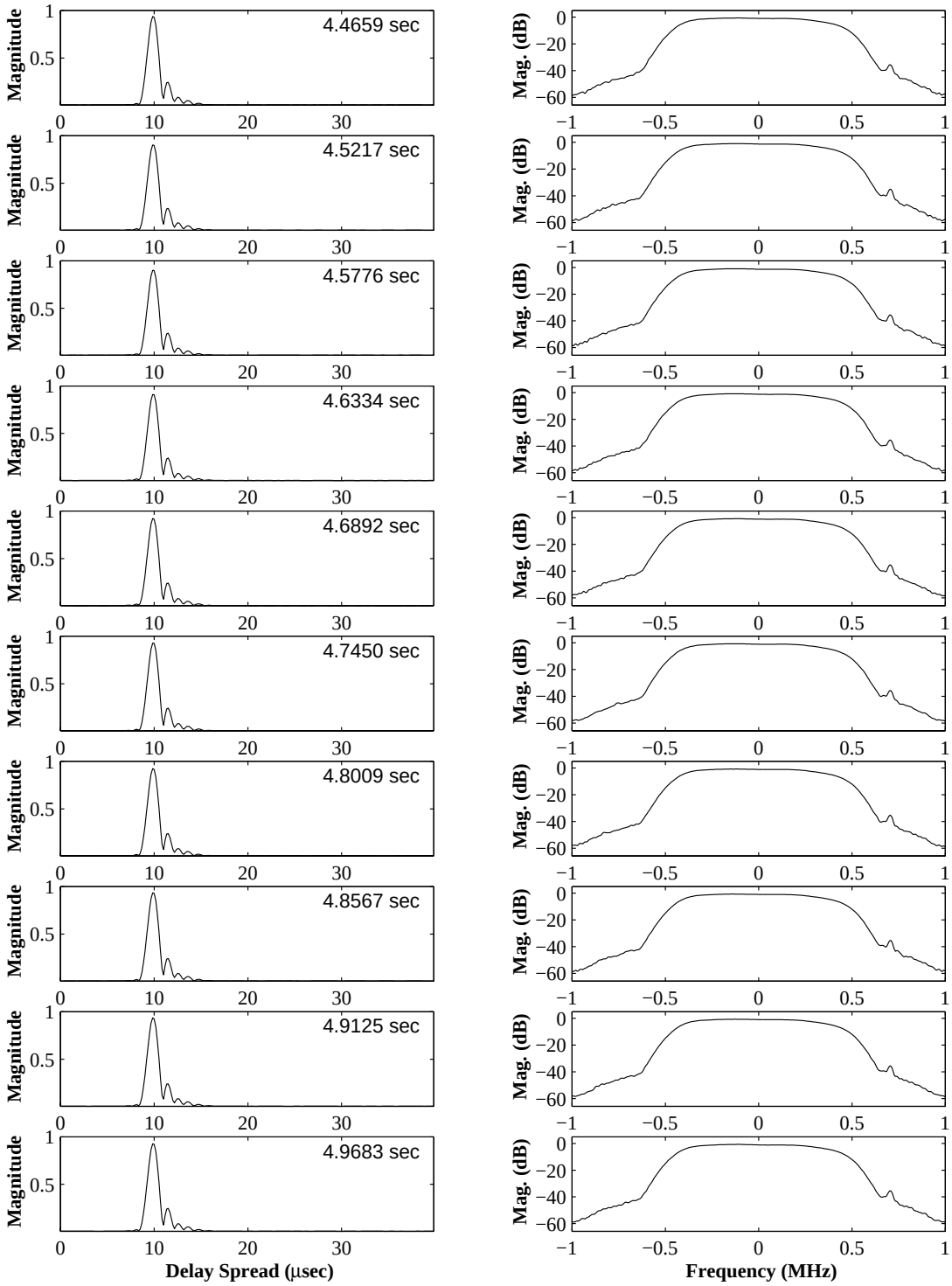

Figure 3.139: Local power delay profiles for ship22jan1117 (9).

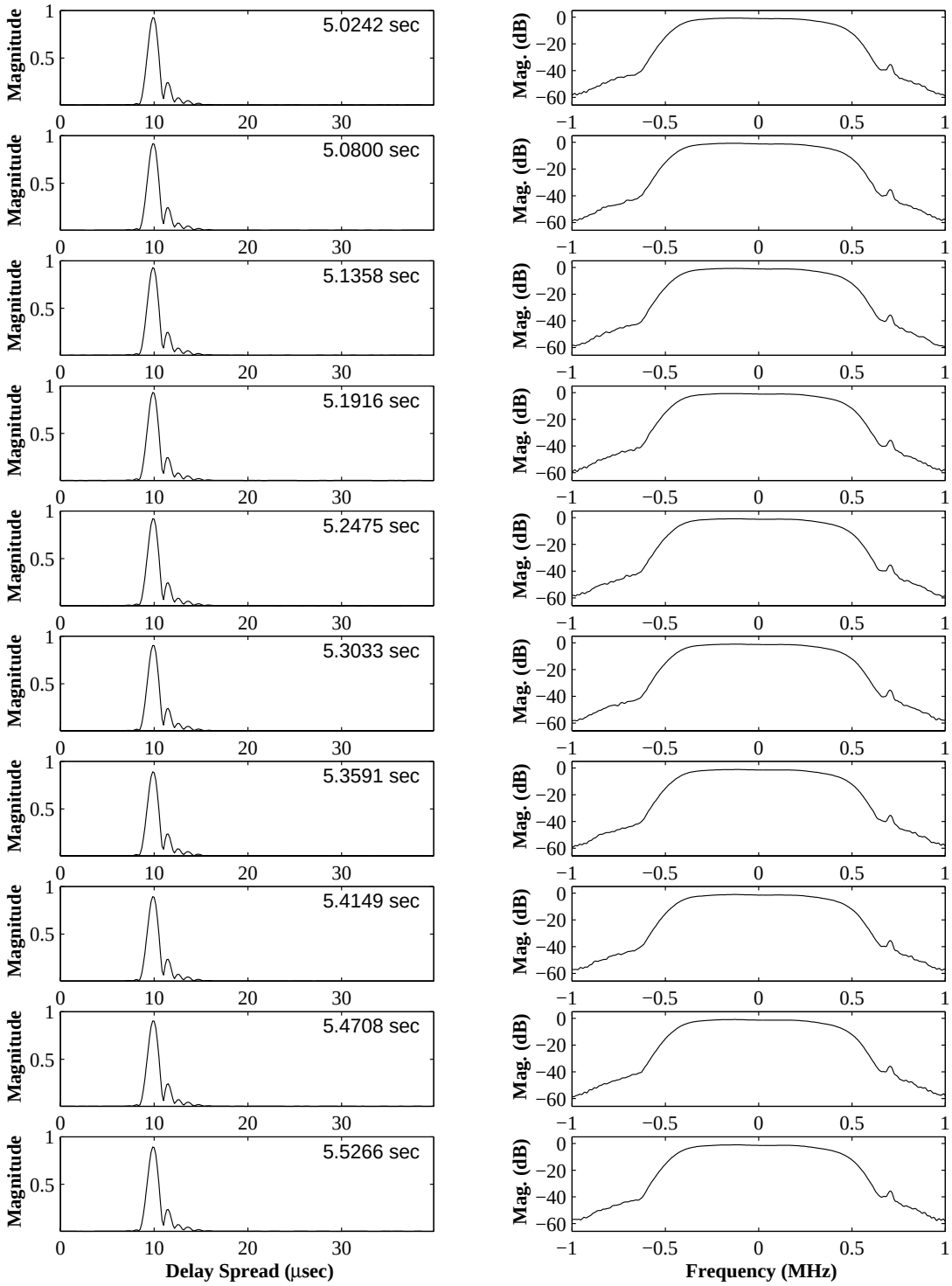

Figure 3.140: Local power delay profiles for ship22jan1117 (10).

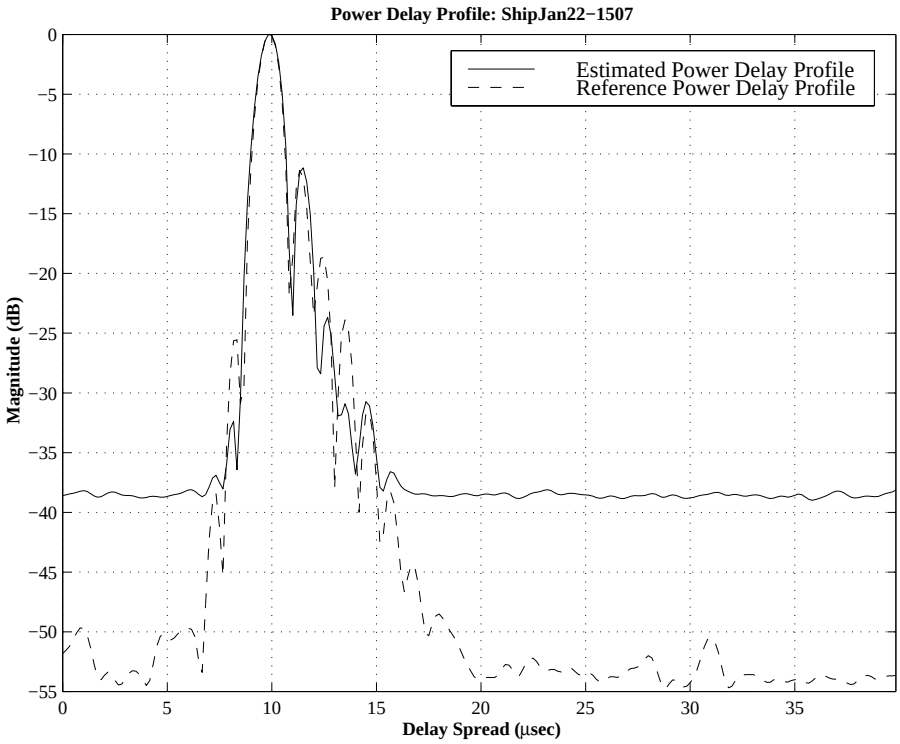

Figure 3.141: Power delay profile for ship22jan1507.

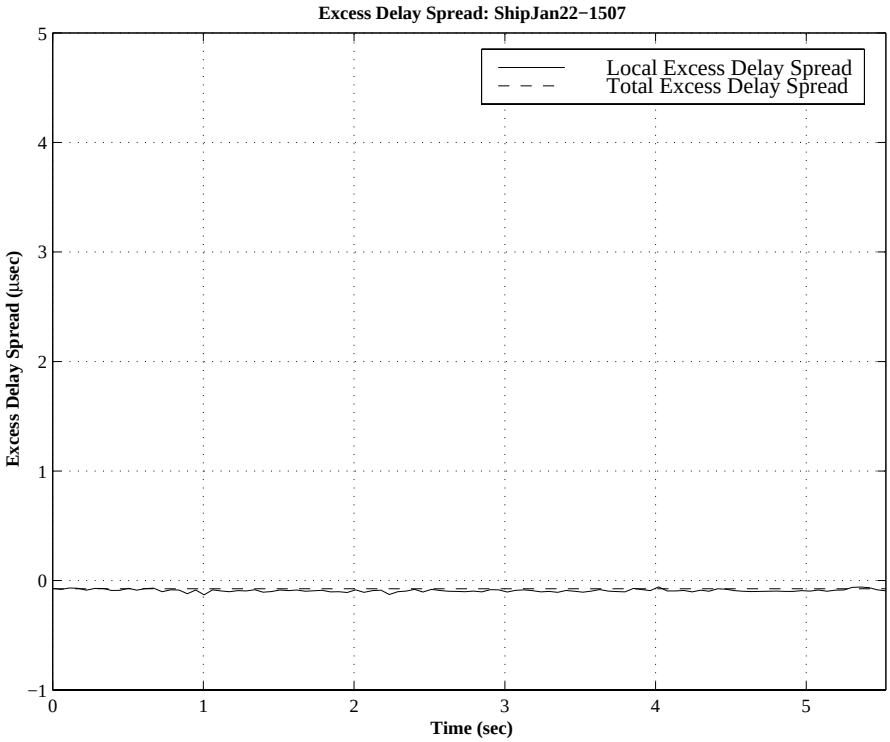

Figure 3.142: Excess delay spread for ship22jan1507.

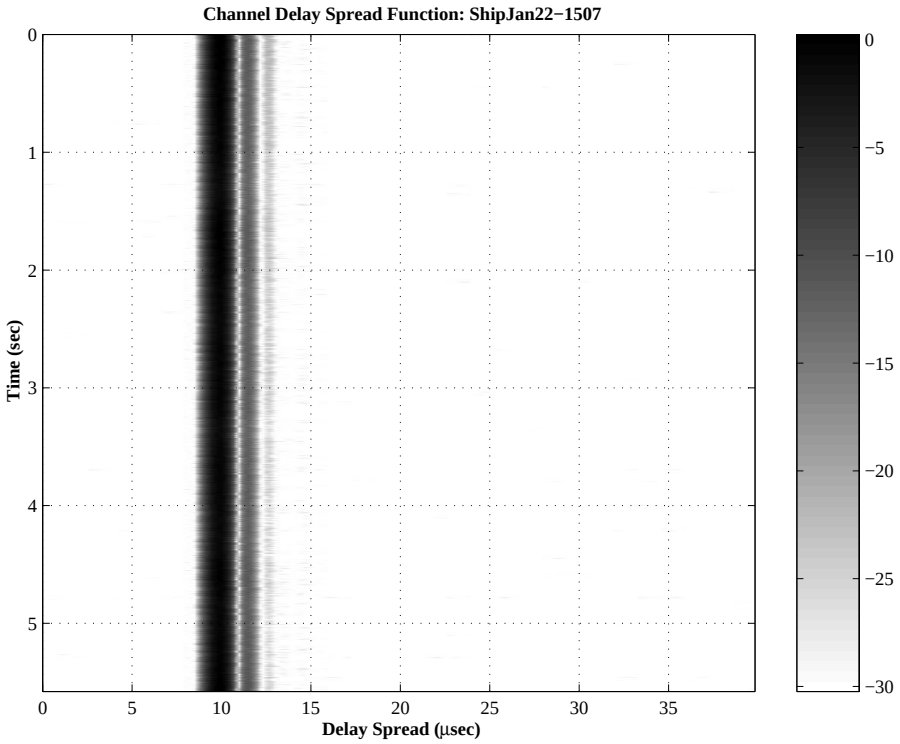

Figure 3.143: Channel delay spread function for ship22jan1507.

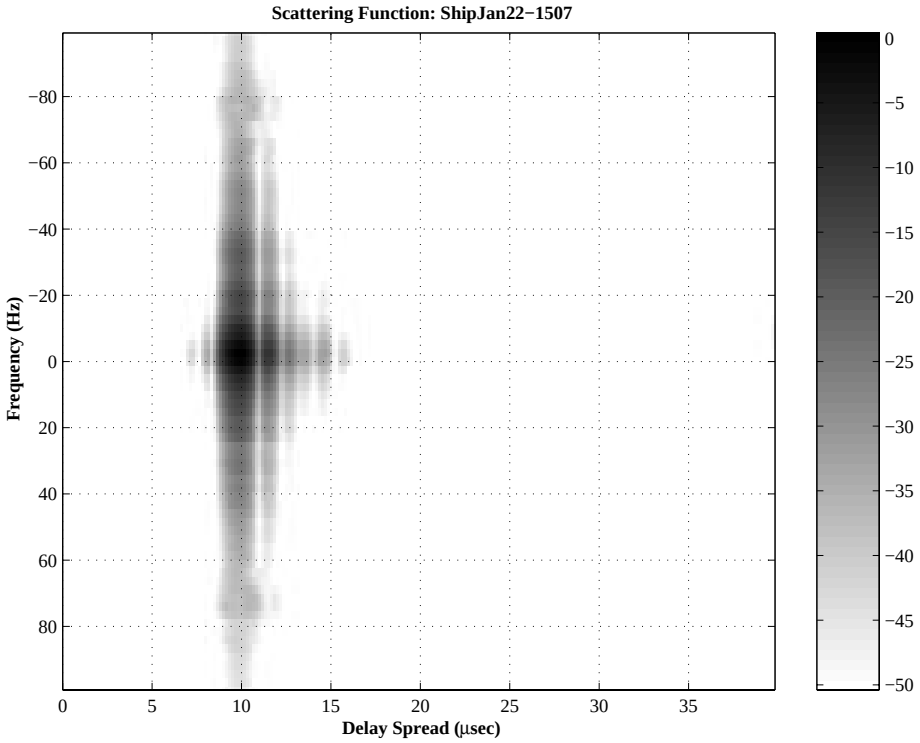

Figure 3.144: Scattering function for ship22jan1507.

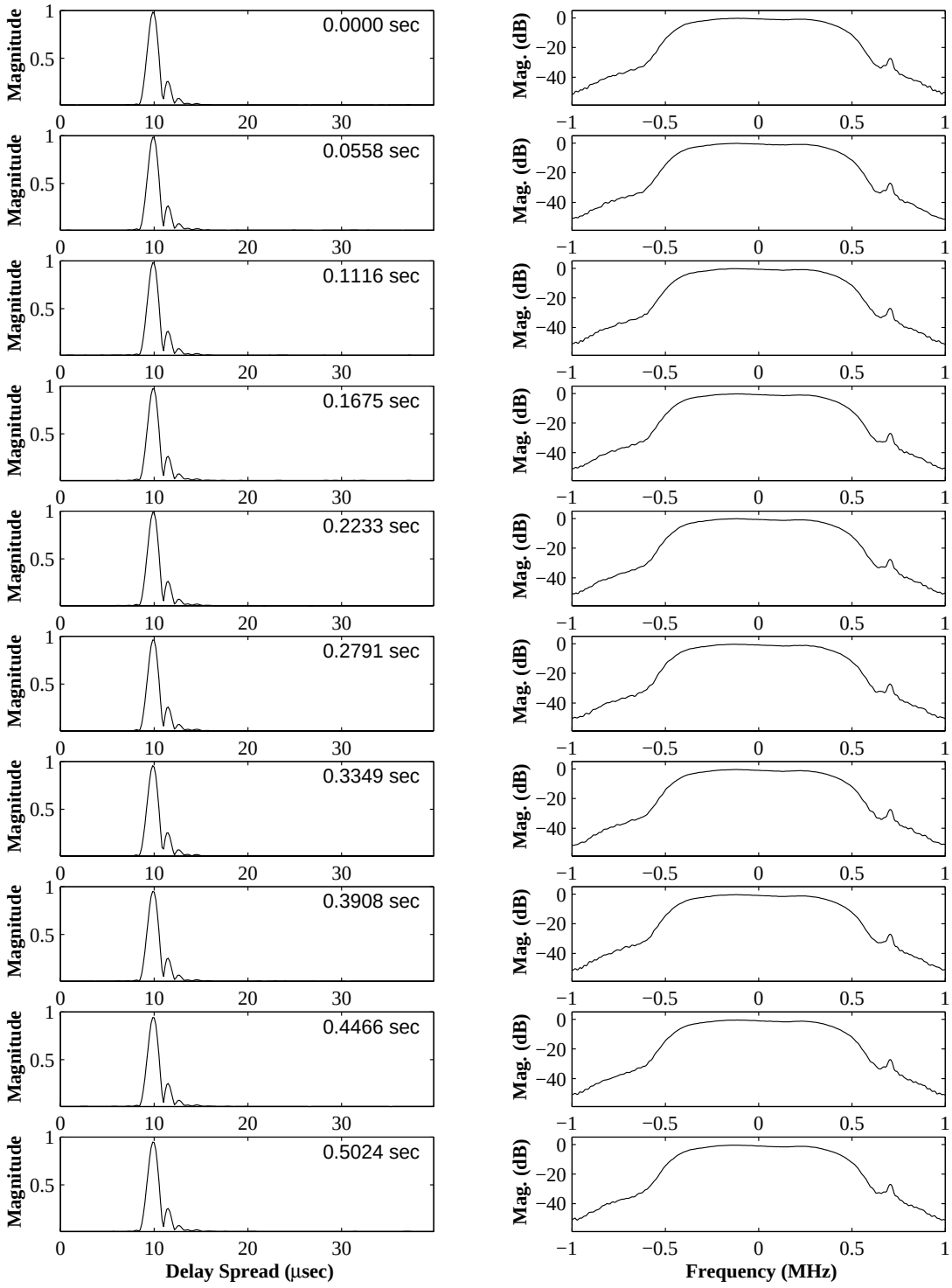

Figure 3.145: Local power delay profiles for ship22jan1507 (1).

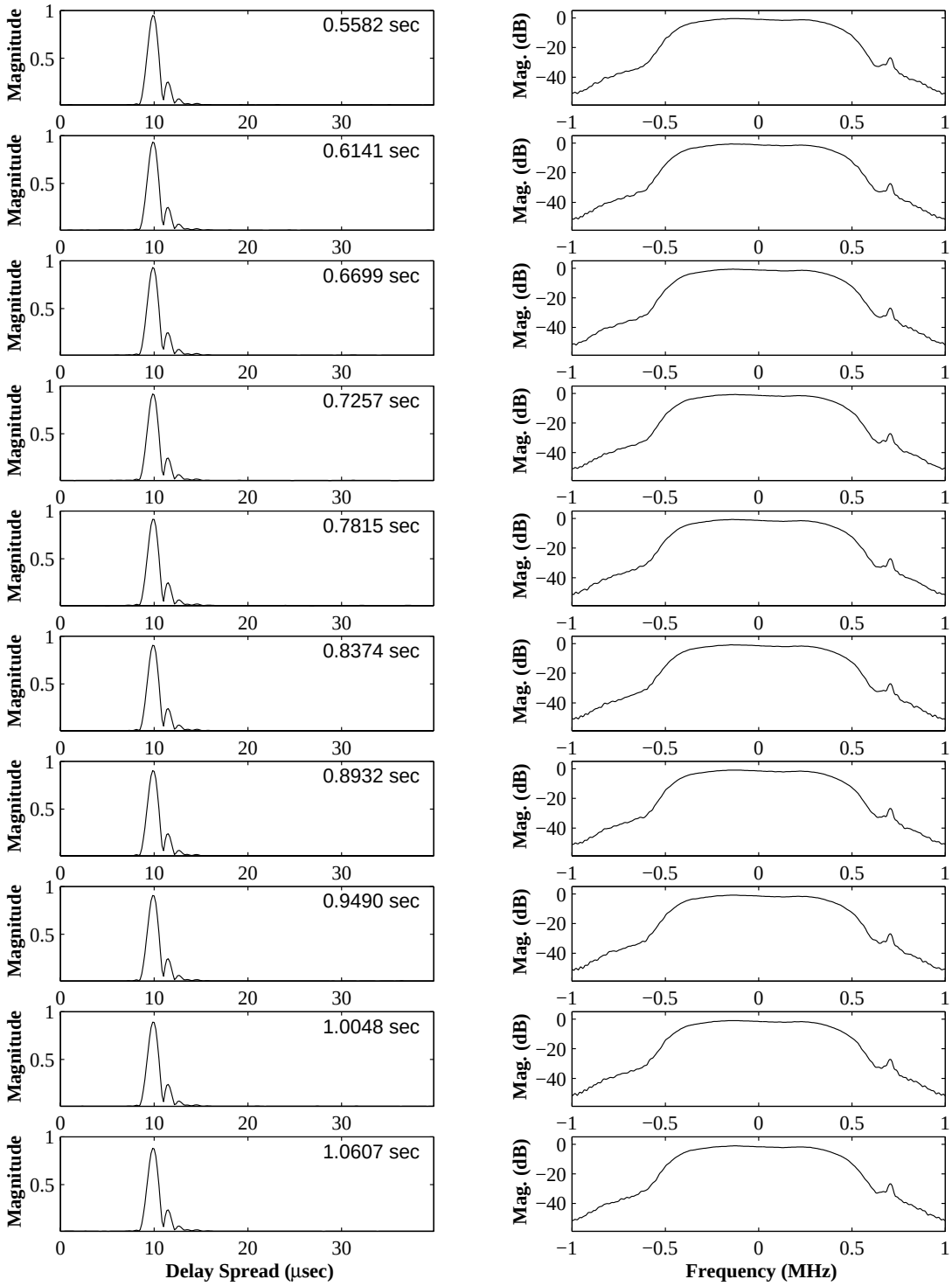

Figure 3.146: Local power delay profiles for ship22jan1507 (2).

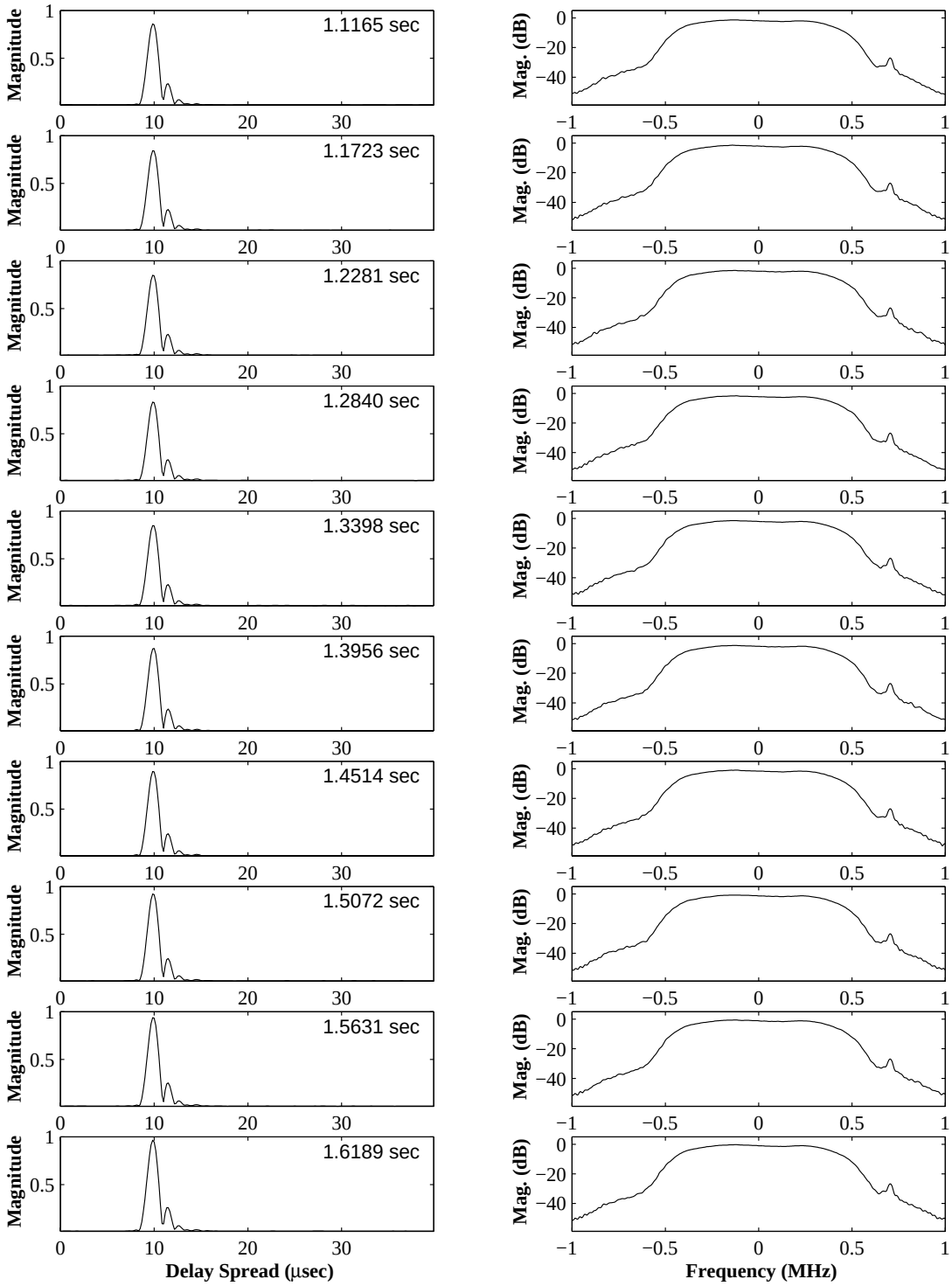

Figure 3.147: Local power delay profiles for ship22jan1507 (3).

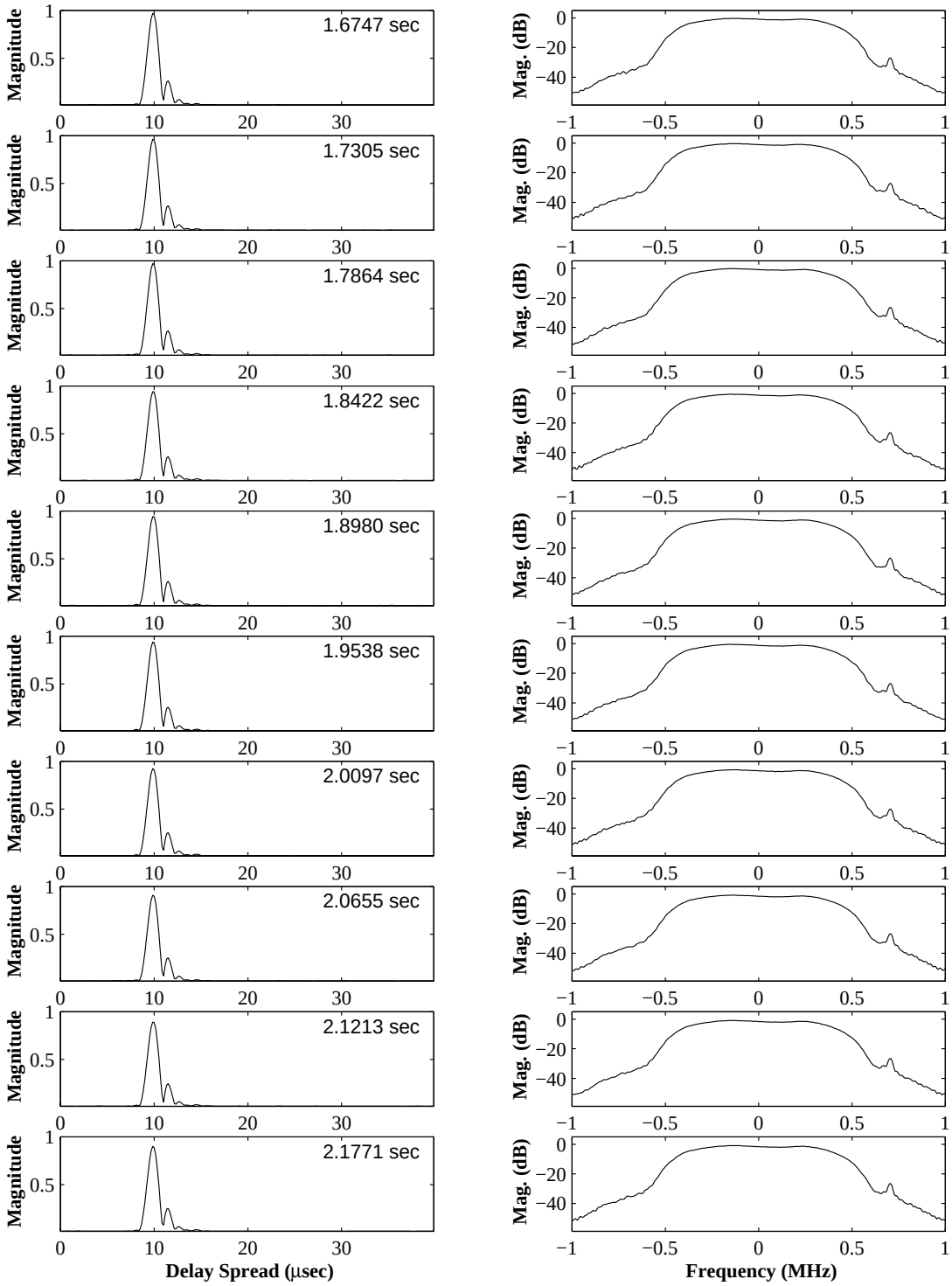

Figure 3.148: Local power delay profiles for ship22jan1507 (4).

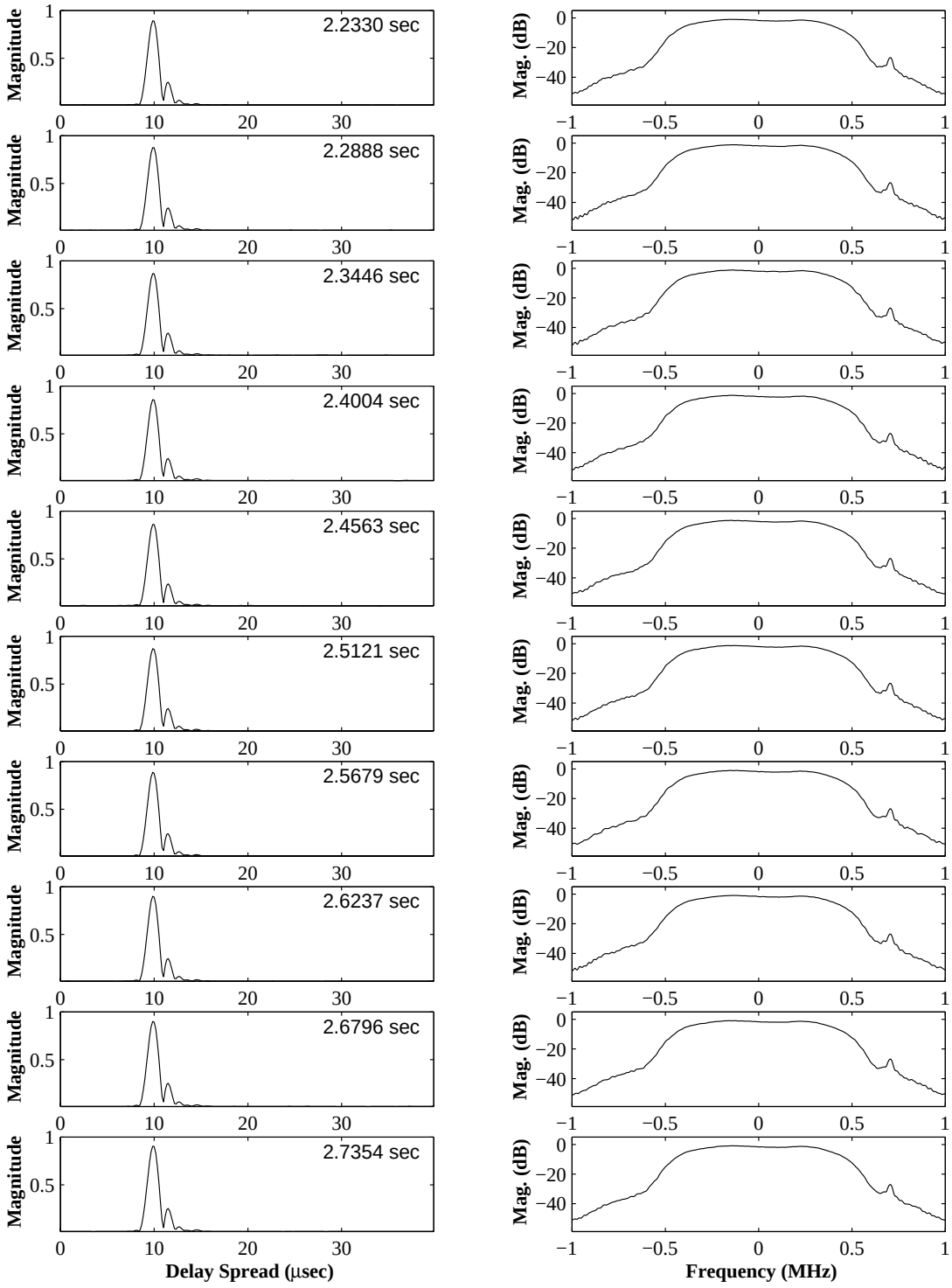

Figure 3.149: Local power delay profiles for ship22jan1507 (5).

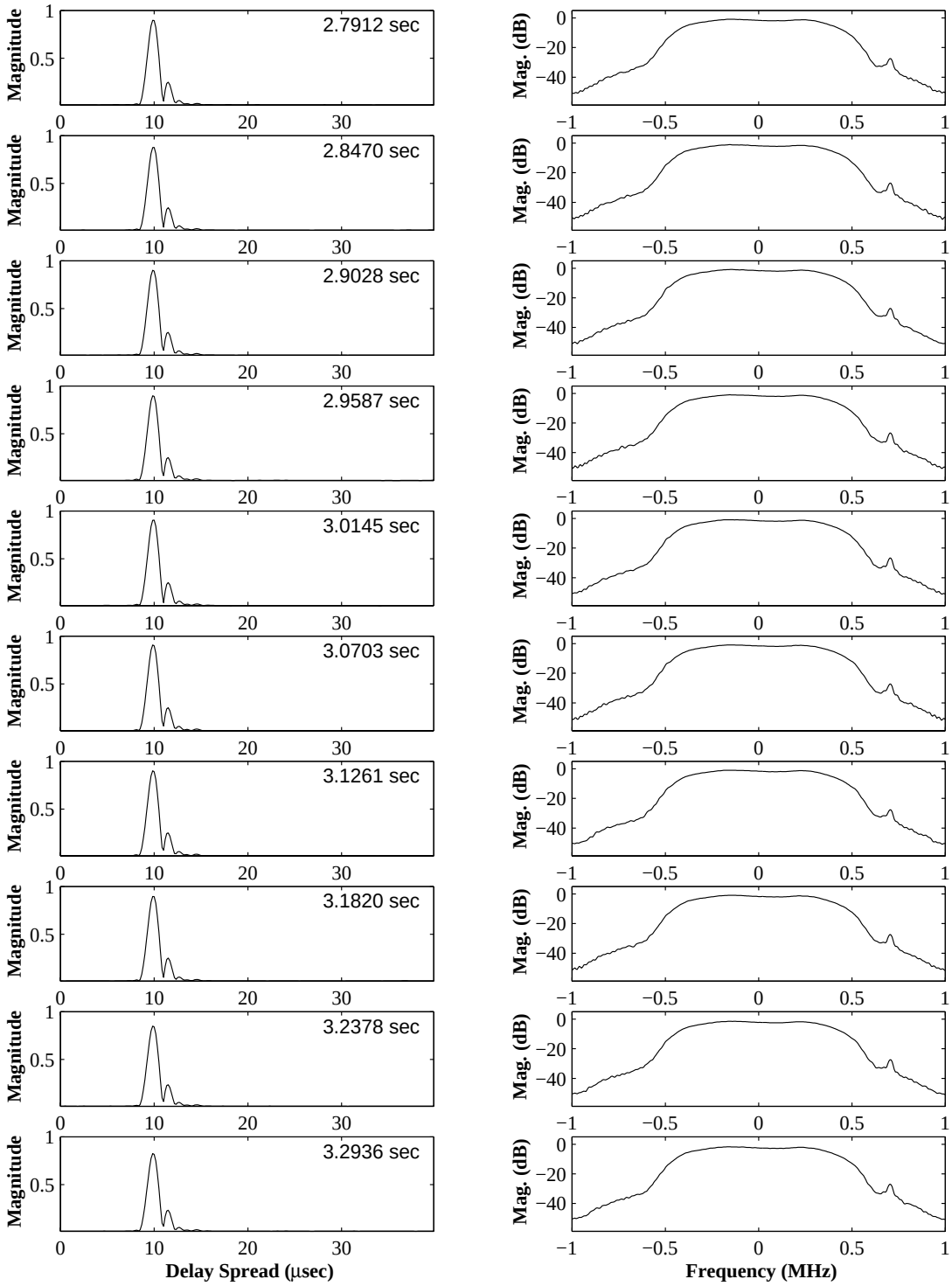

Figure 3.150: Local power delay profiles for ship22jan1507 (6).

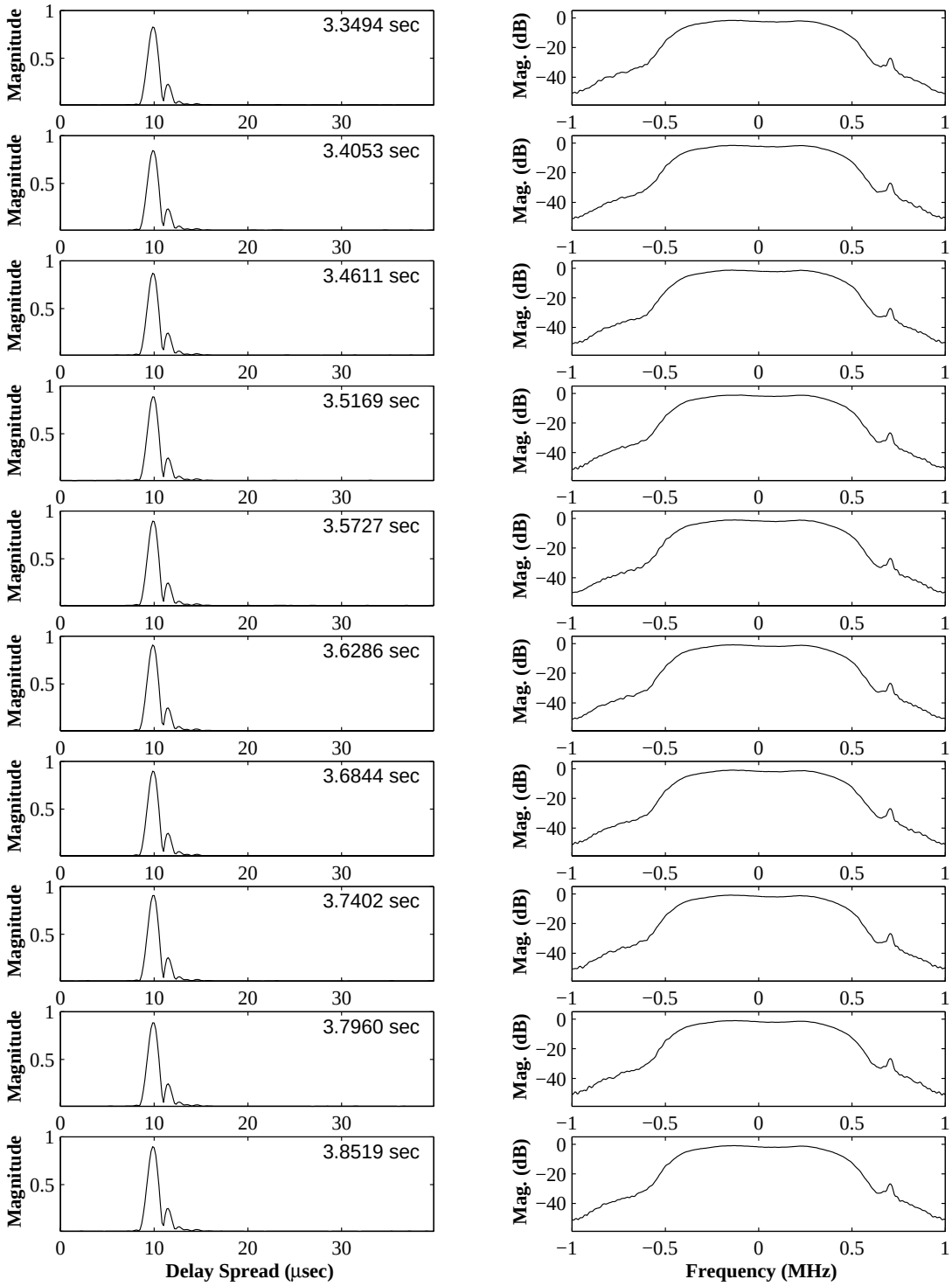

Figure 3.151: Local power delay profiles for ship22jan1507 (7).

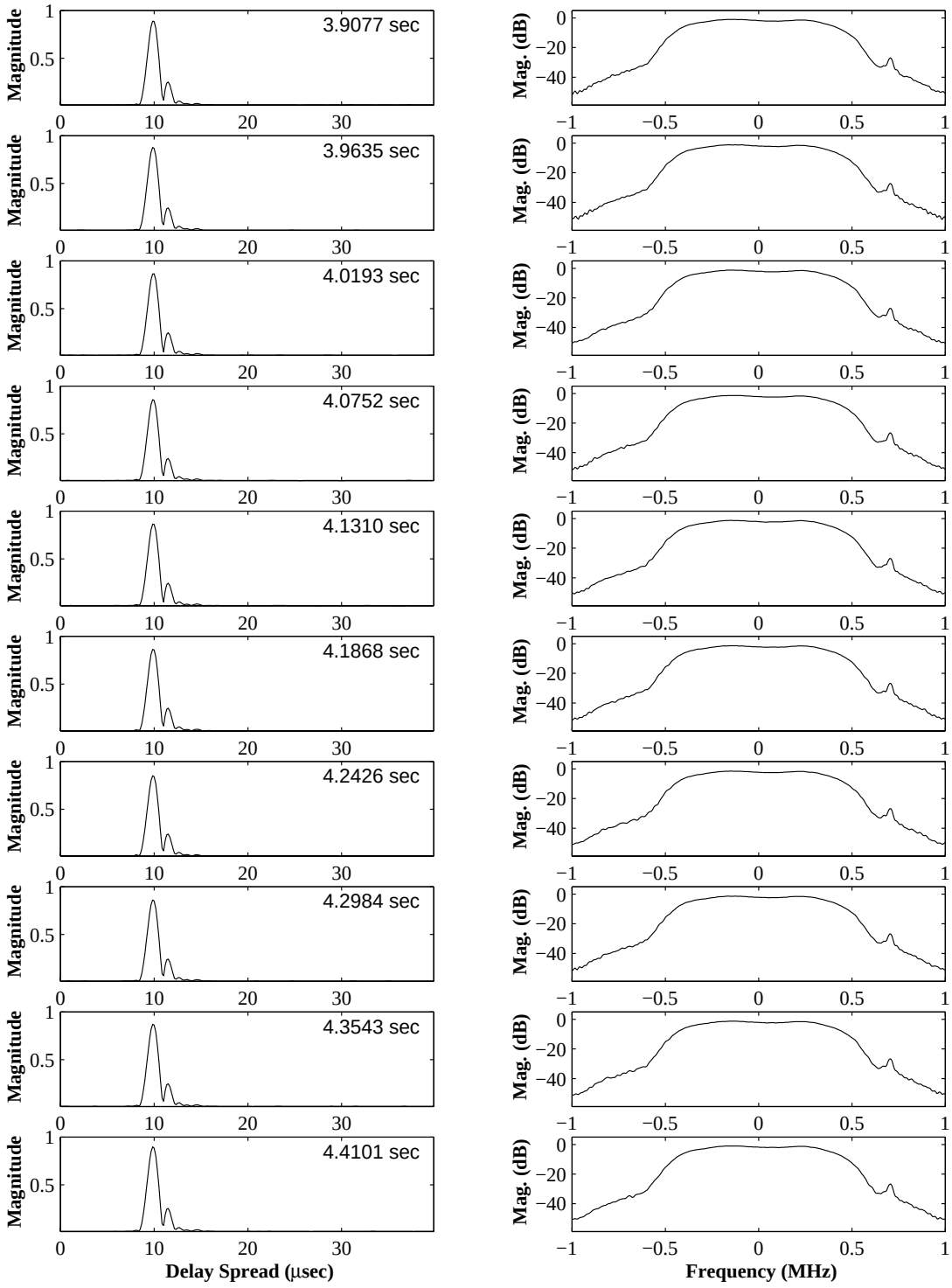

Figure 3.152: Local power delay profiles for ship22jan1507 (8).

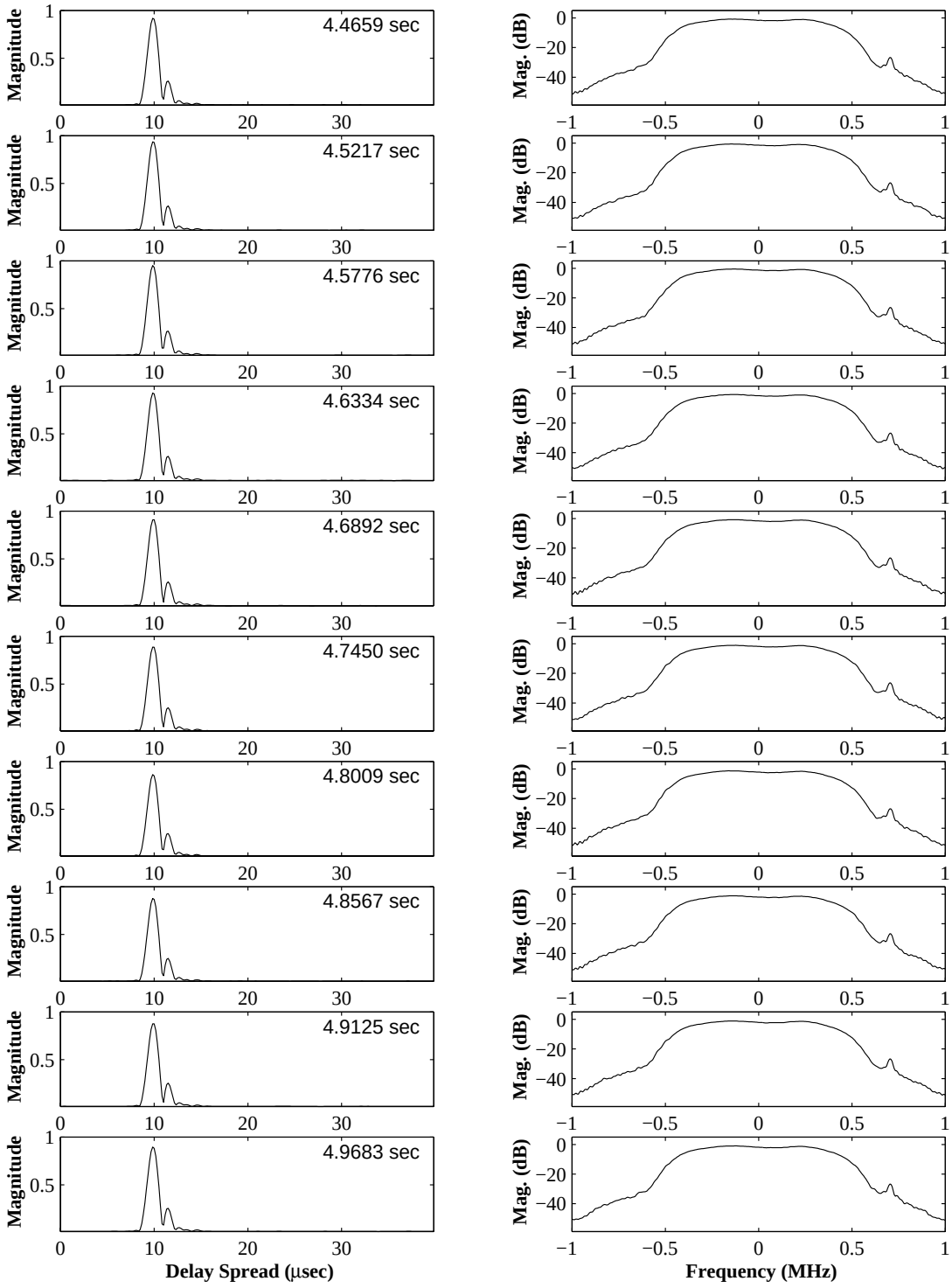

Figure 3.153: Local power delay profiles for ship22jan1507 (9).

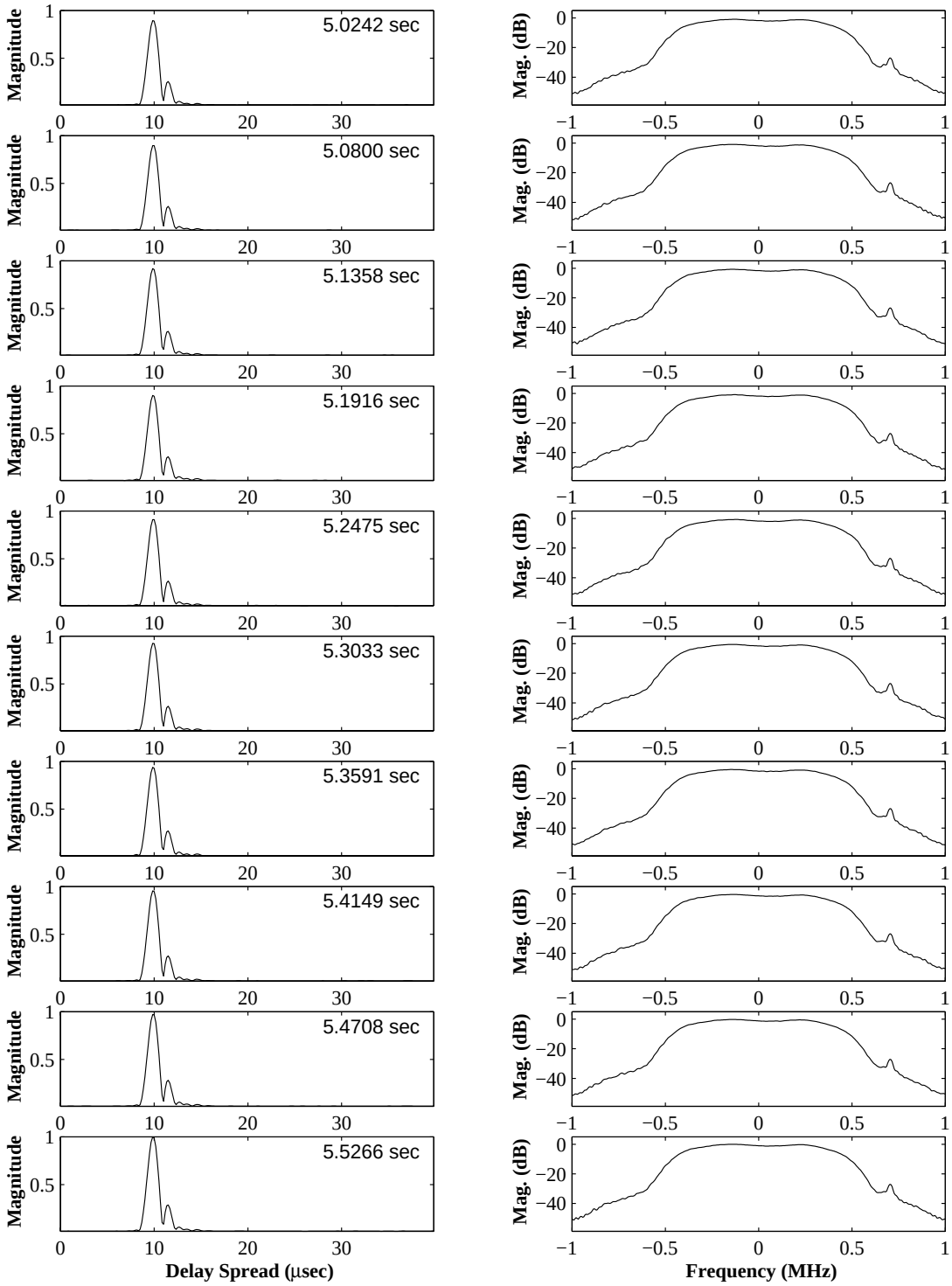

Figure 3.154: Local power delay profiles for ship22jan1507 (10).

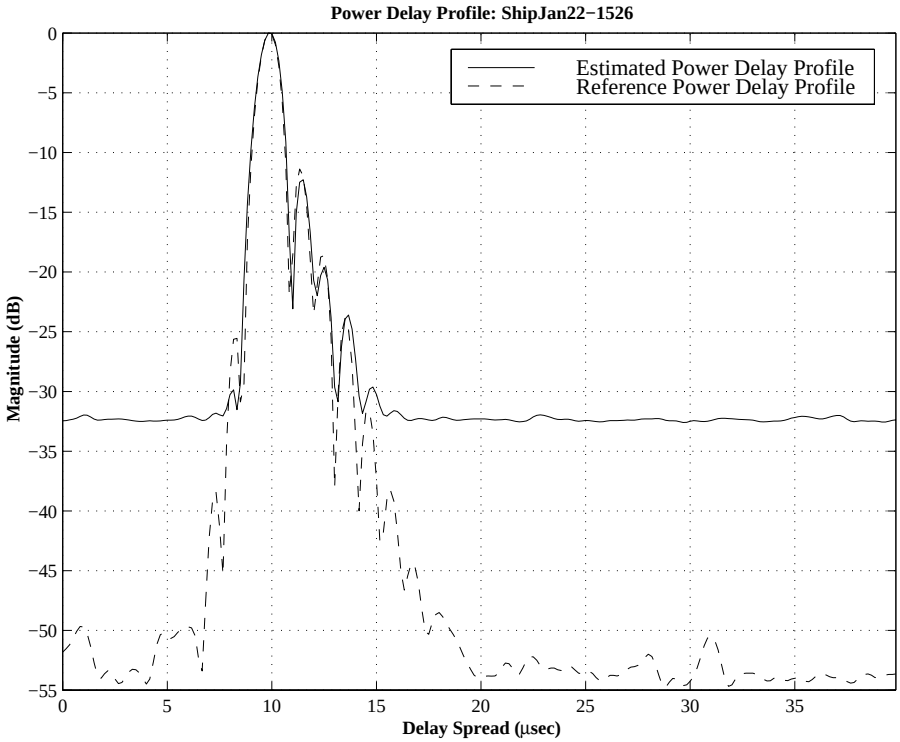

Figure 3.155: Power delay profile for ship22jan1526.

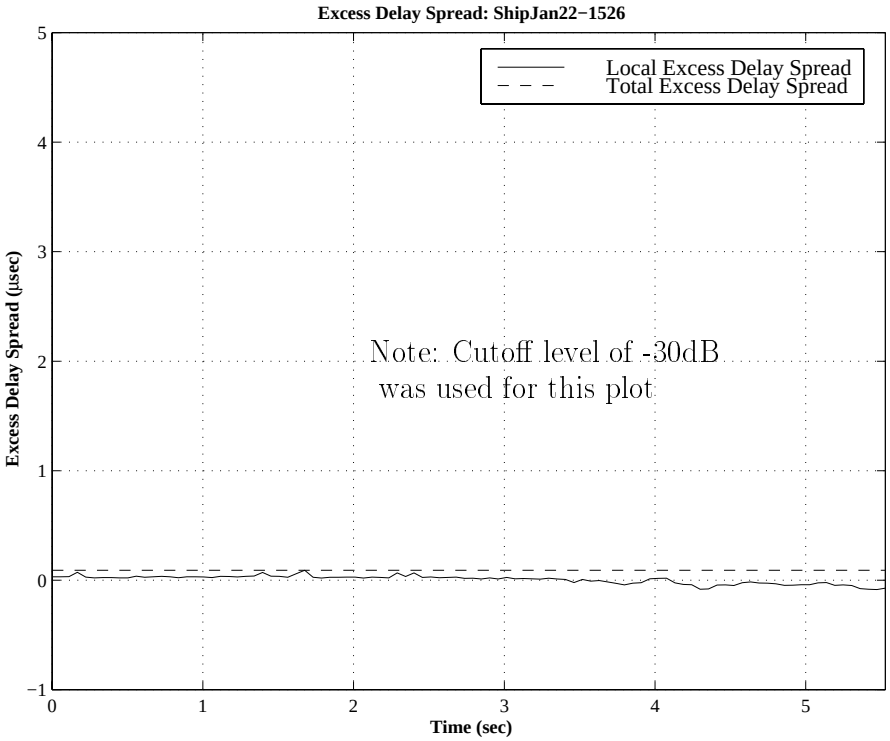

Figure 3.156: Excess delay spread for ship22jan1526.

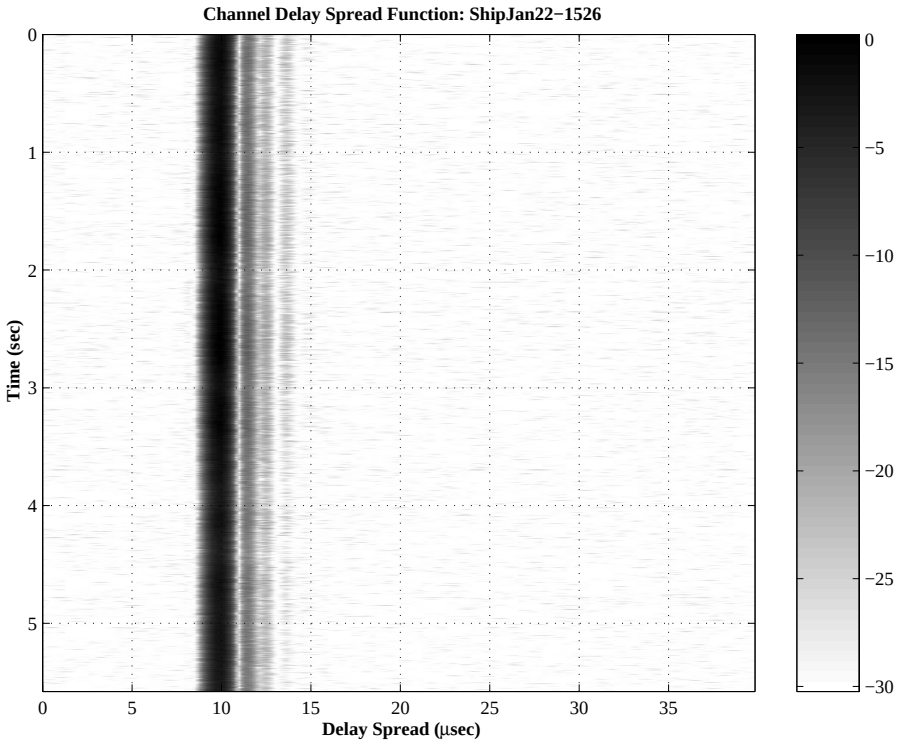

Figure 3.157: Channel delay spread function for ship22jan1526.

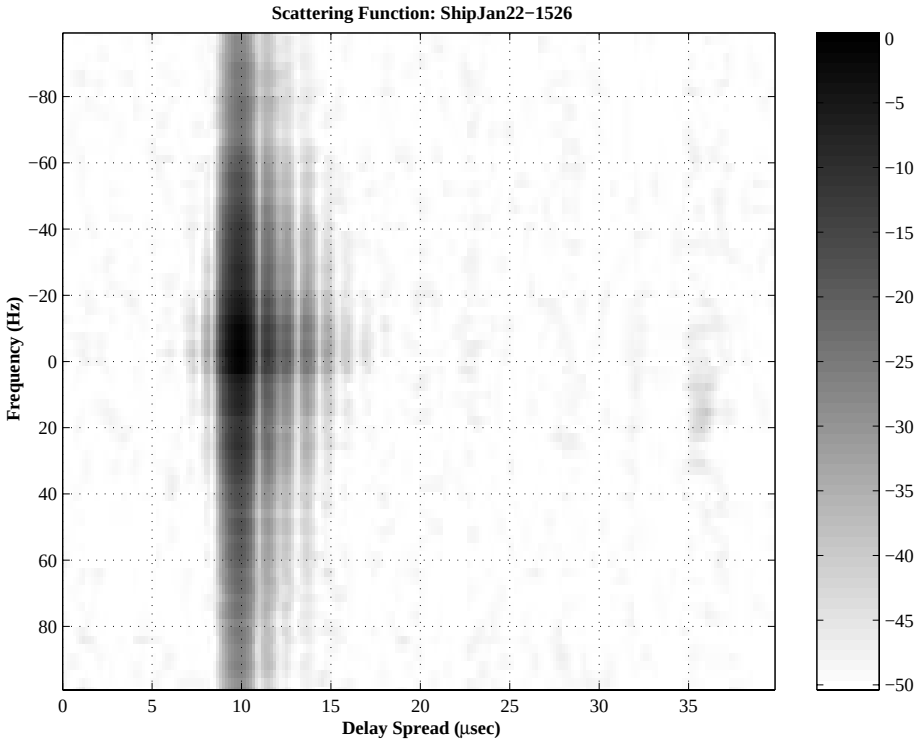

Figure 3.158: Scattering function for ship22jan1526.

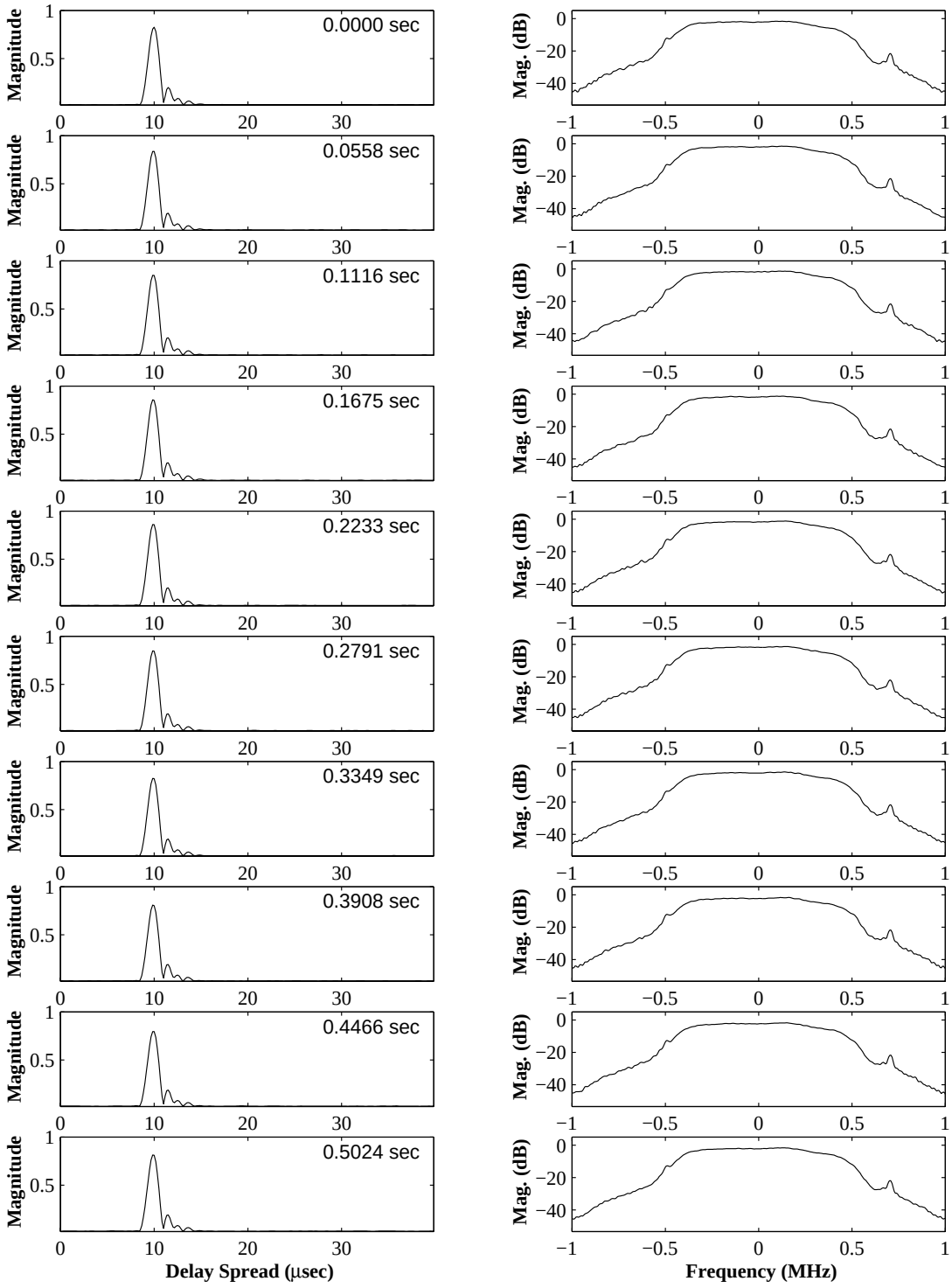

Figure 3.159: Local power delay profiles for ship22jan1526 (1).

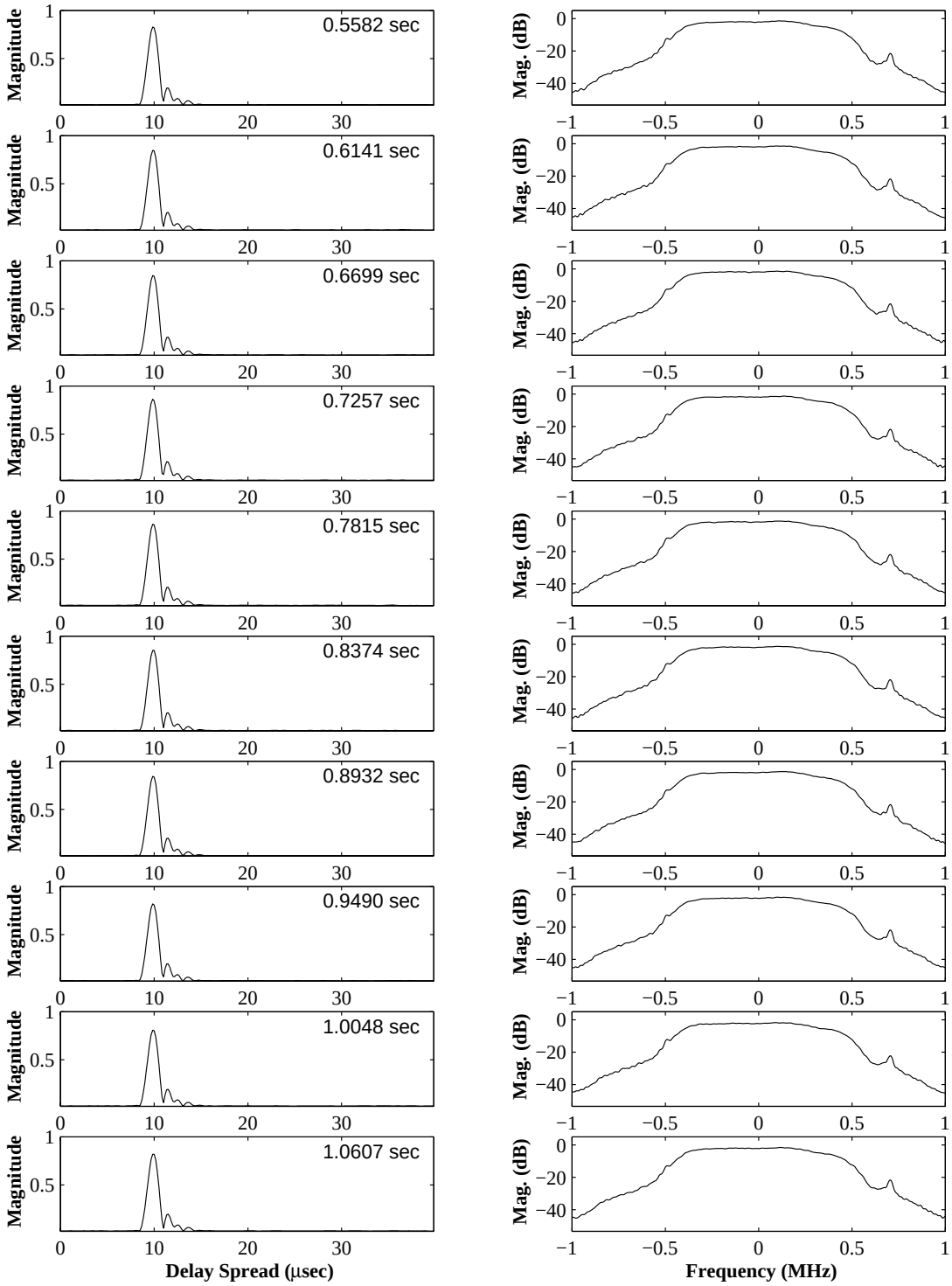

Figure 3.160: Local power delay profiles for ship22jan1526 (2).

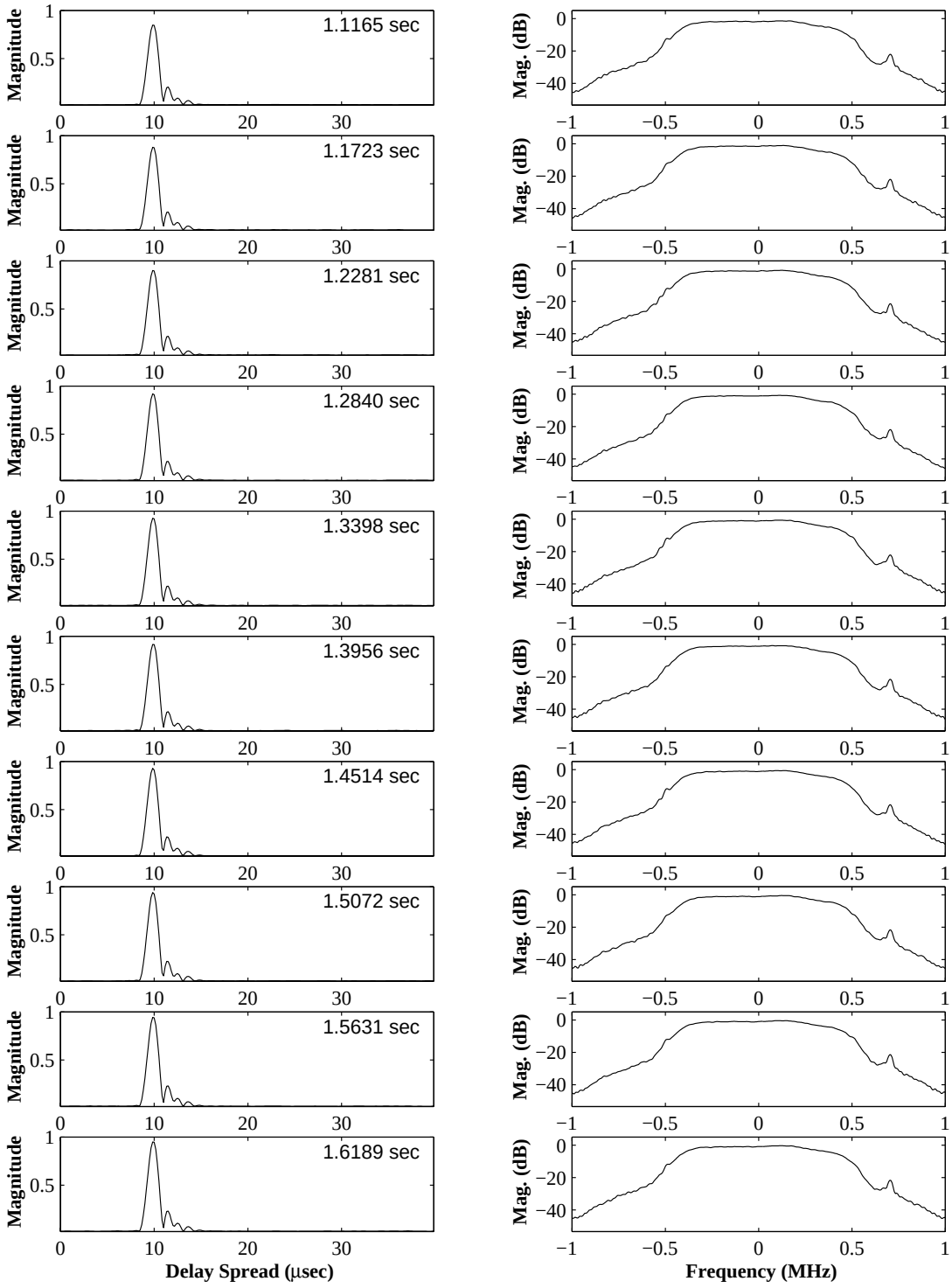

Figure 3.161: Local power delay profiles for ship22jan1526 (3).

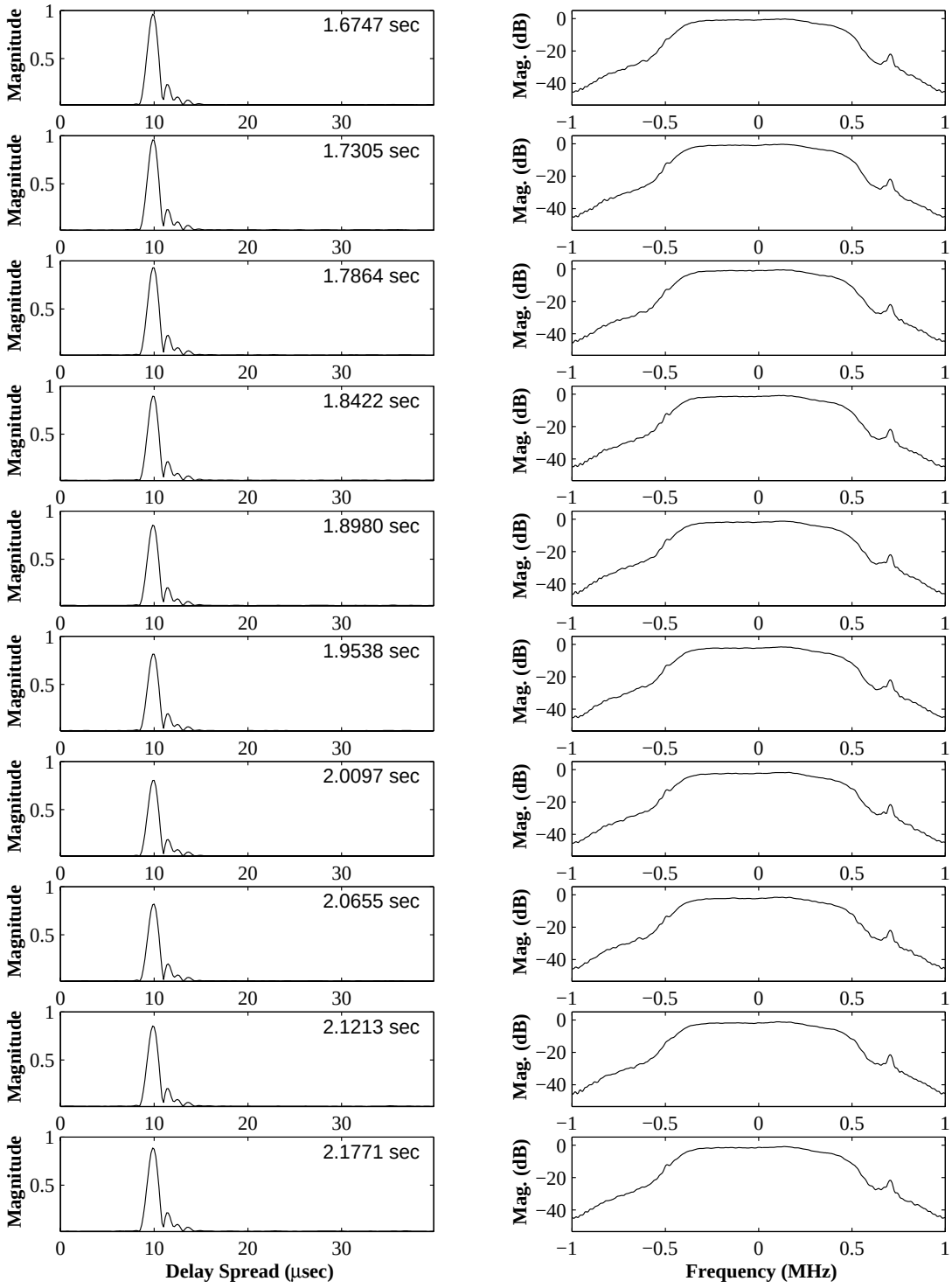

Figure 3.162: Local power delay profiles for ship22jan1526 (4).

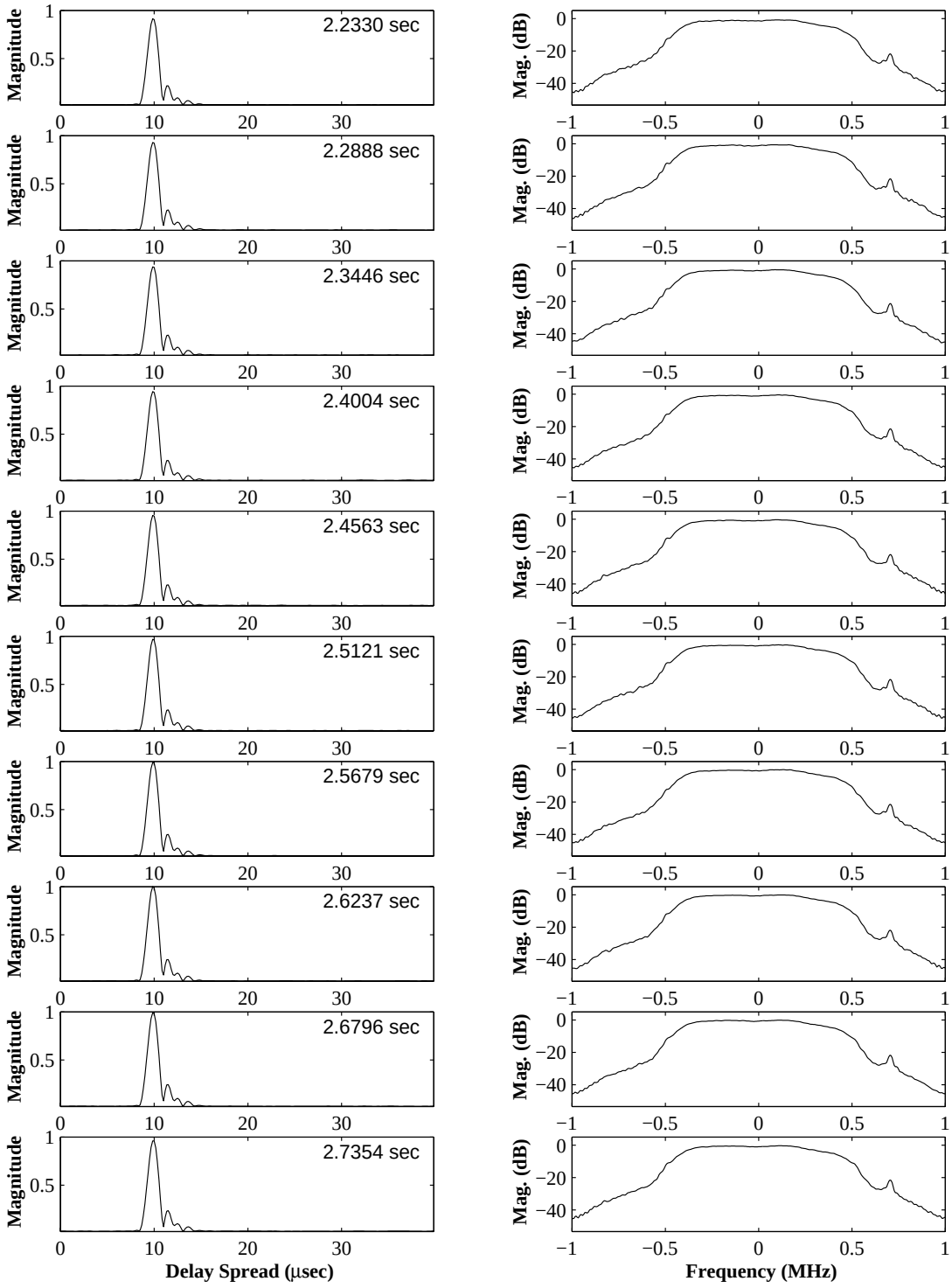

Figure 3.163: Local power delay profiles for ship22jan1526 (5).

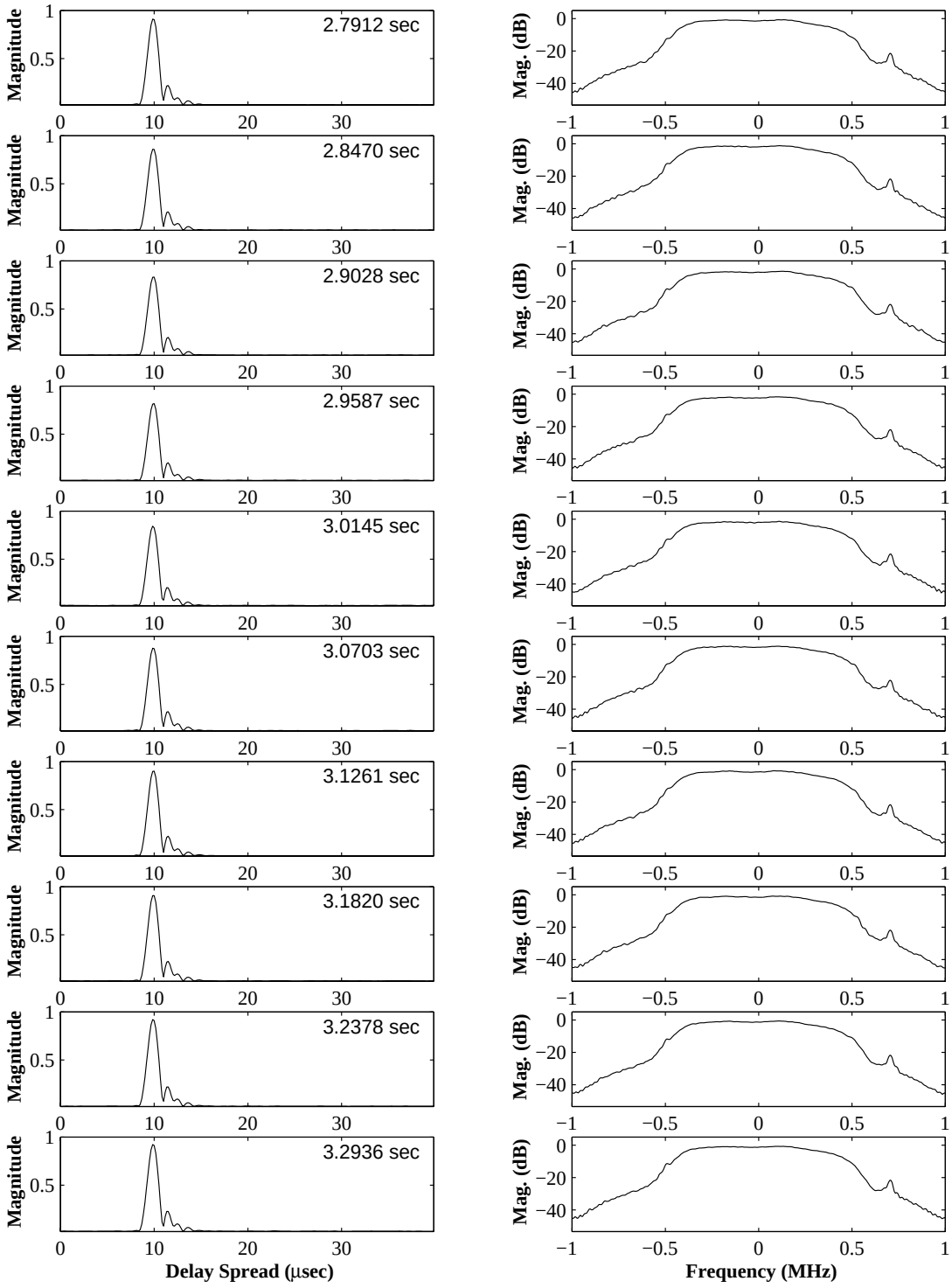

Figure 3.164: Local power delay profiles for ship22jan1526 (6).

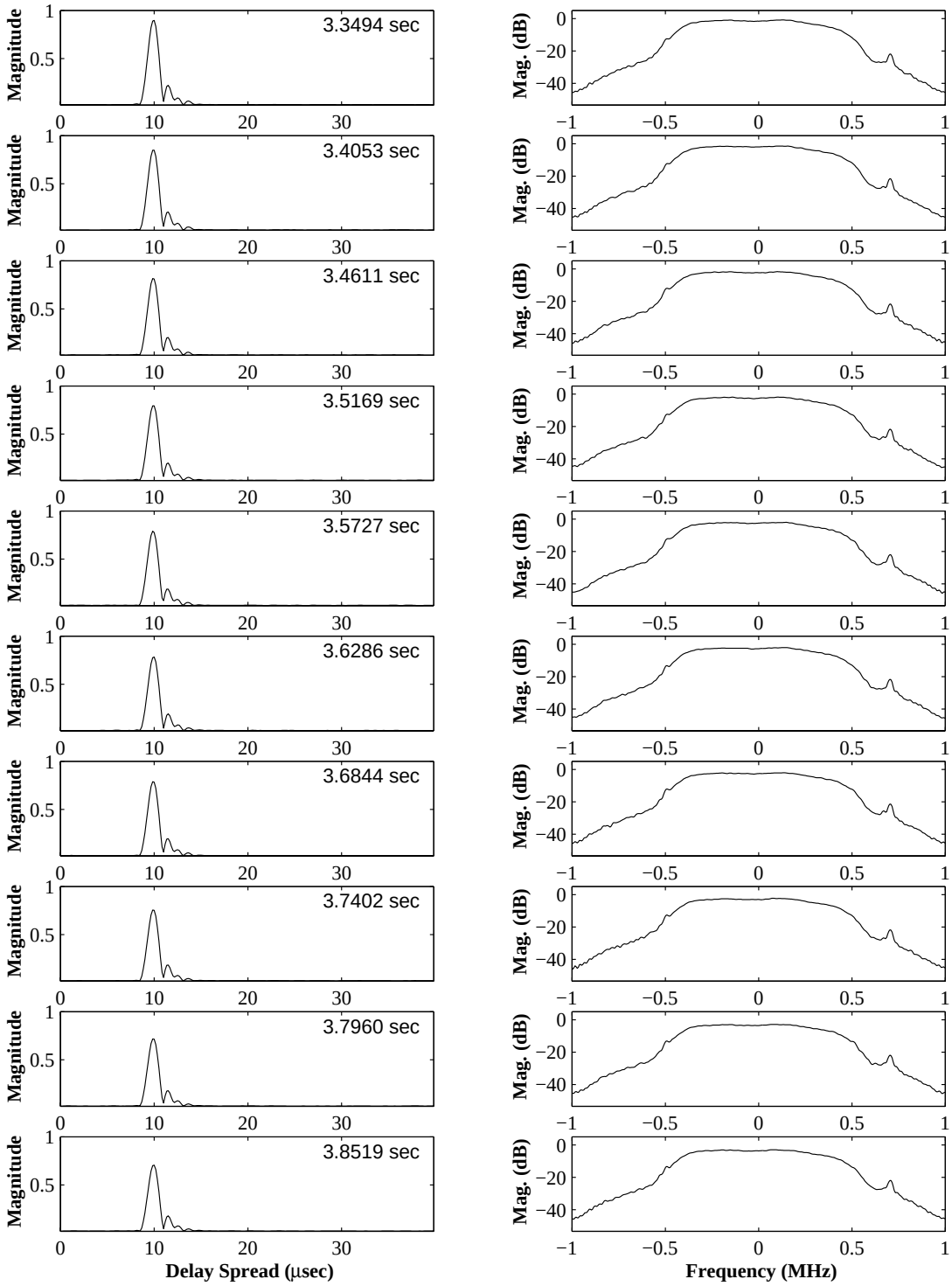

Figure 3.165: Local power delay profiles for ship22jan1526 (7).

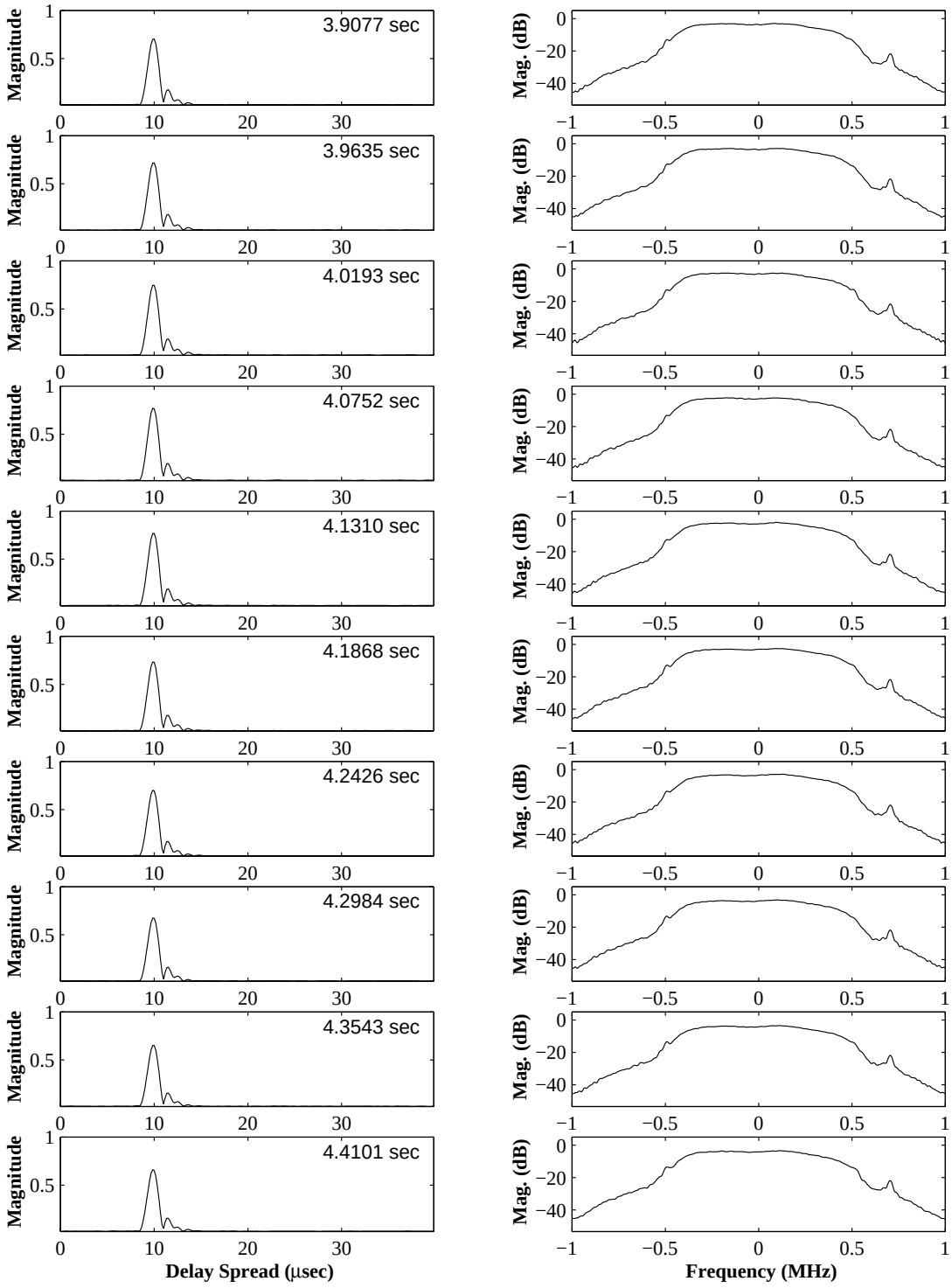

Figure 3.166: Local power delay profiles for ship22jan1526 (8).

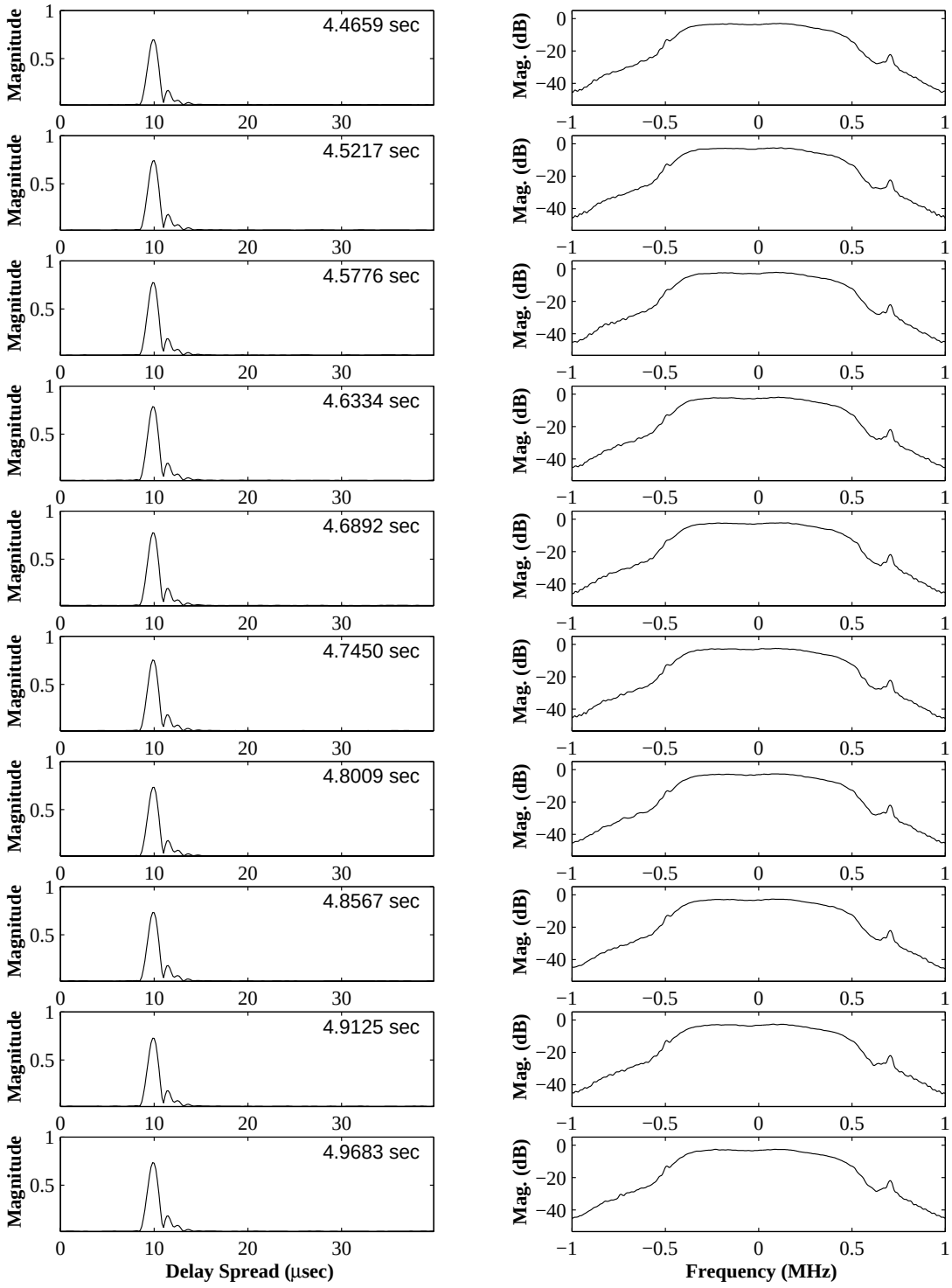

Figure 3.167: Local power delay profiles for ship22jan1526 (9).

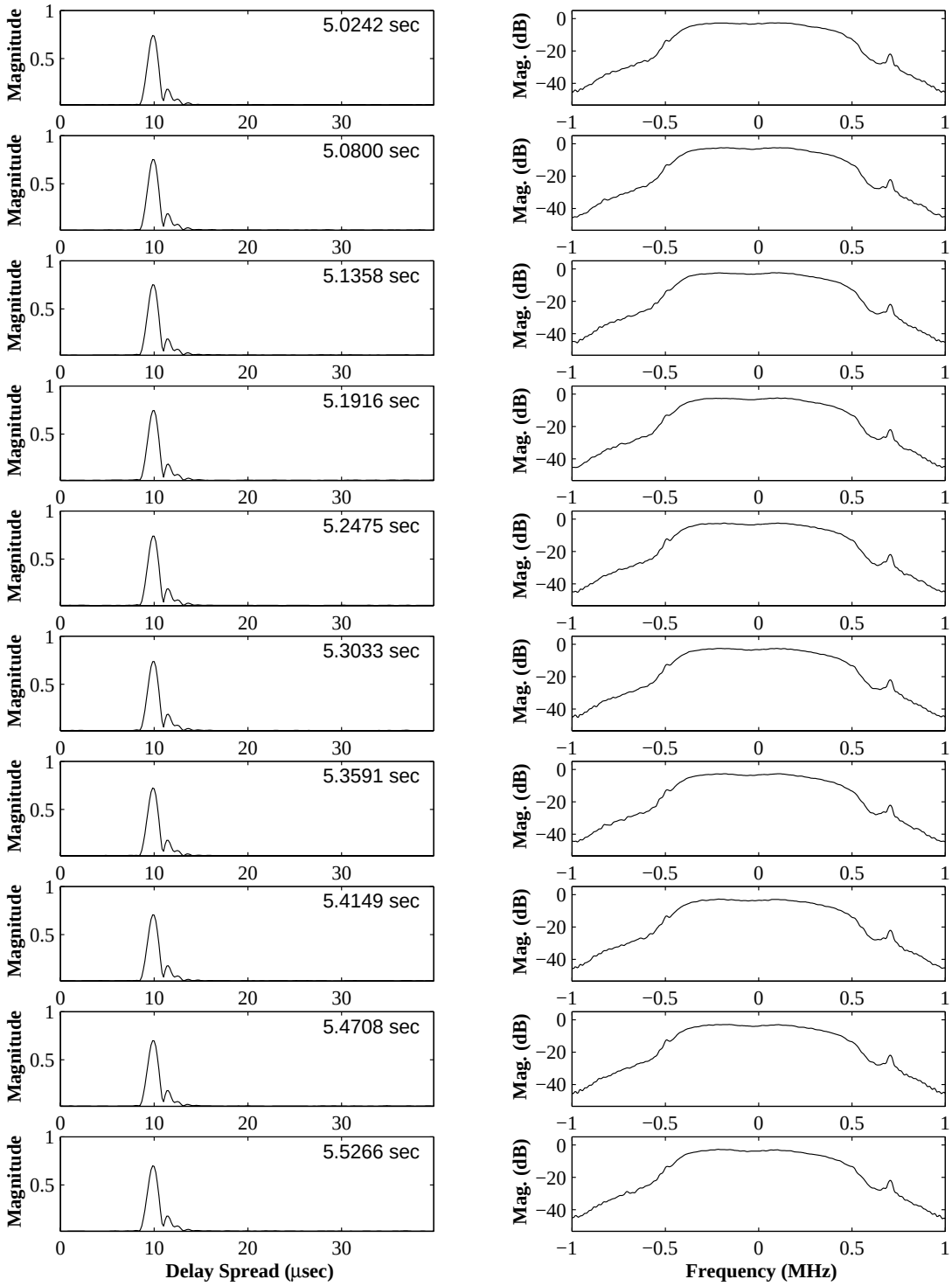

Figure 3.168: Local power delay profiles for ship22jan1526 (10).

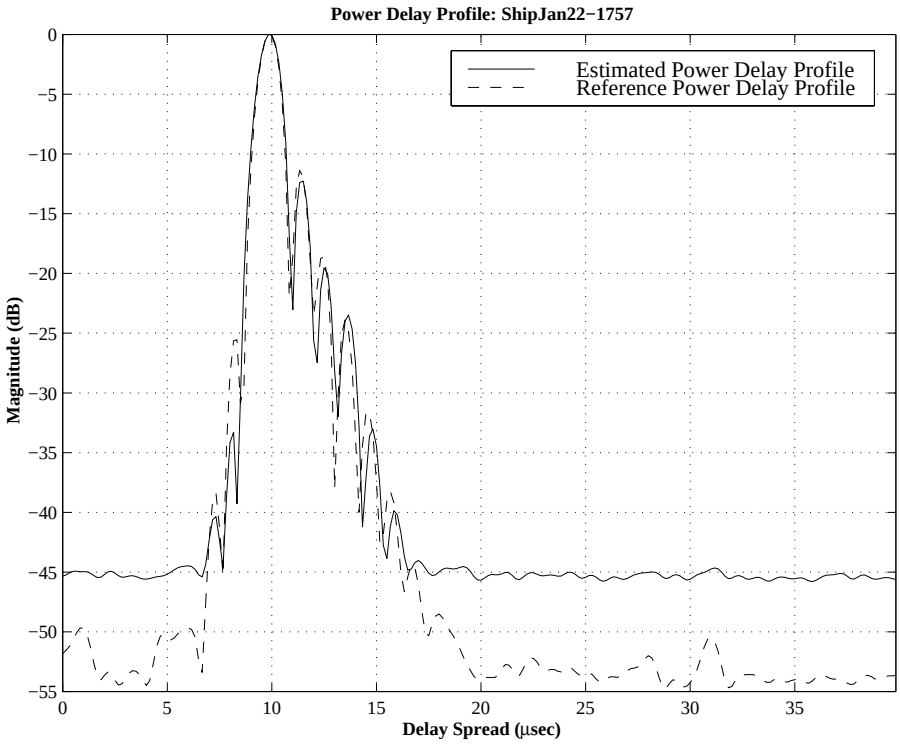

Figure 3.169: Power delay profile for ship22jan1757.

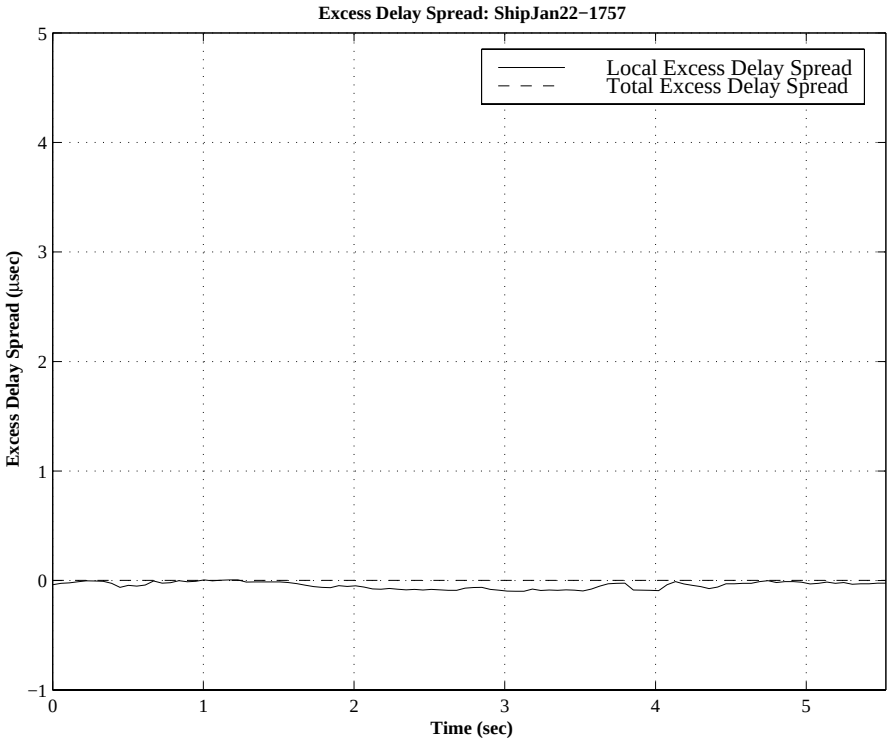

Figure 3.170: Excess delay spread for ship22jan1757.

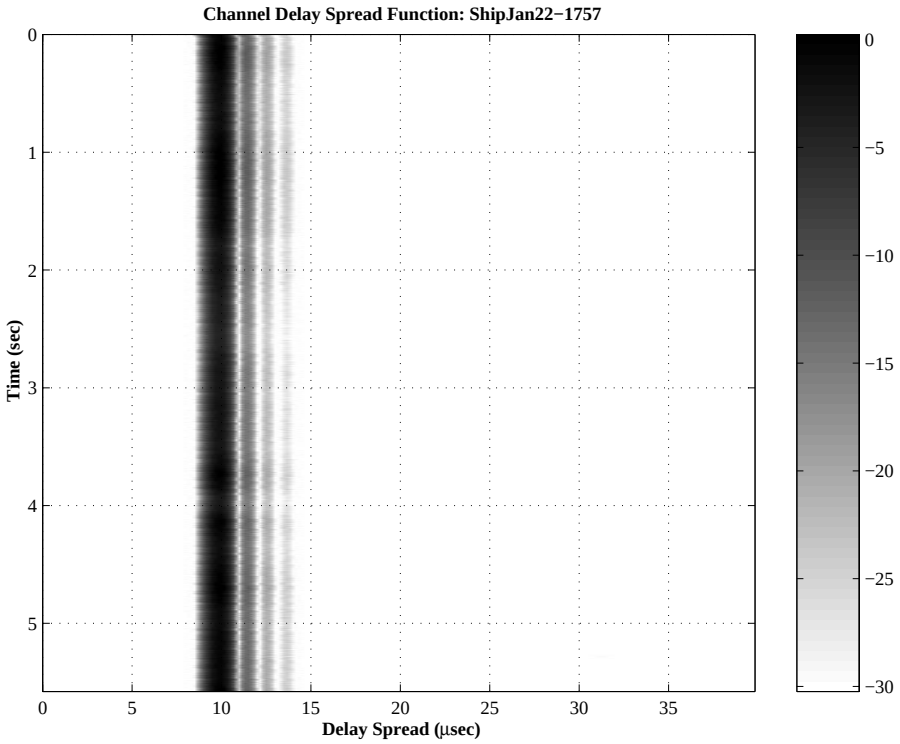

Figure 3.171: Channel delay spread function for ship22jan1757.

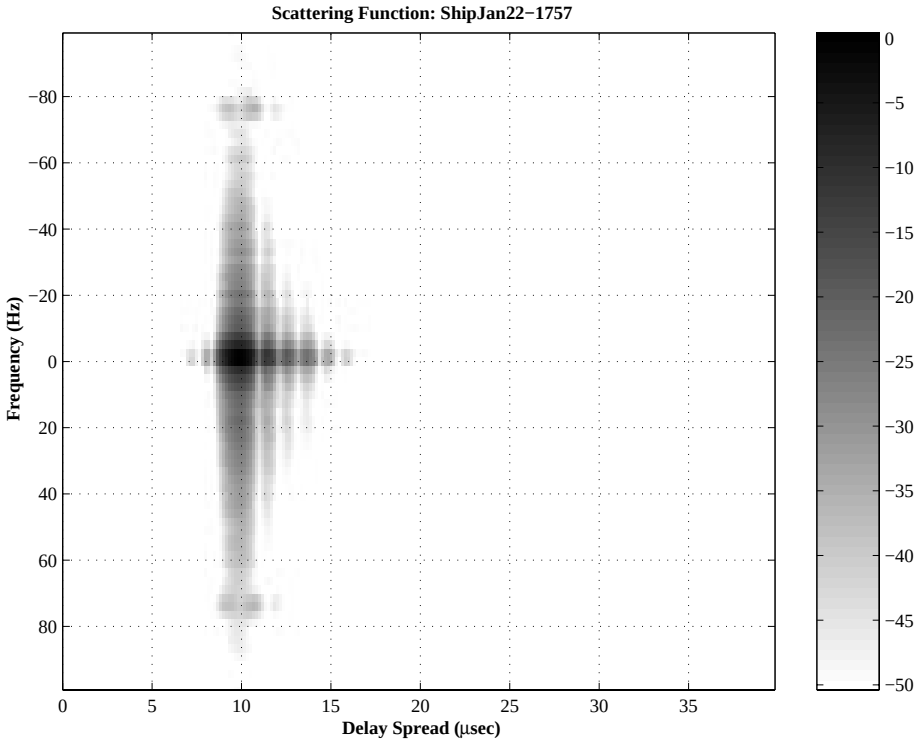

Figure 3.172: Scattering function for ship22jan1757.

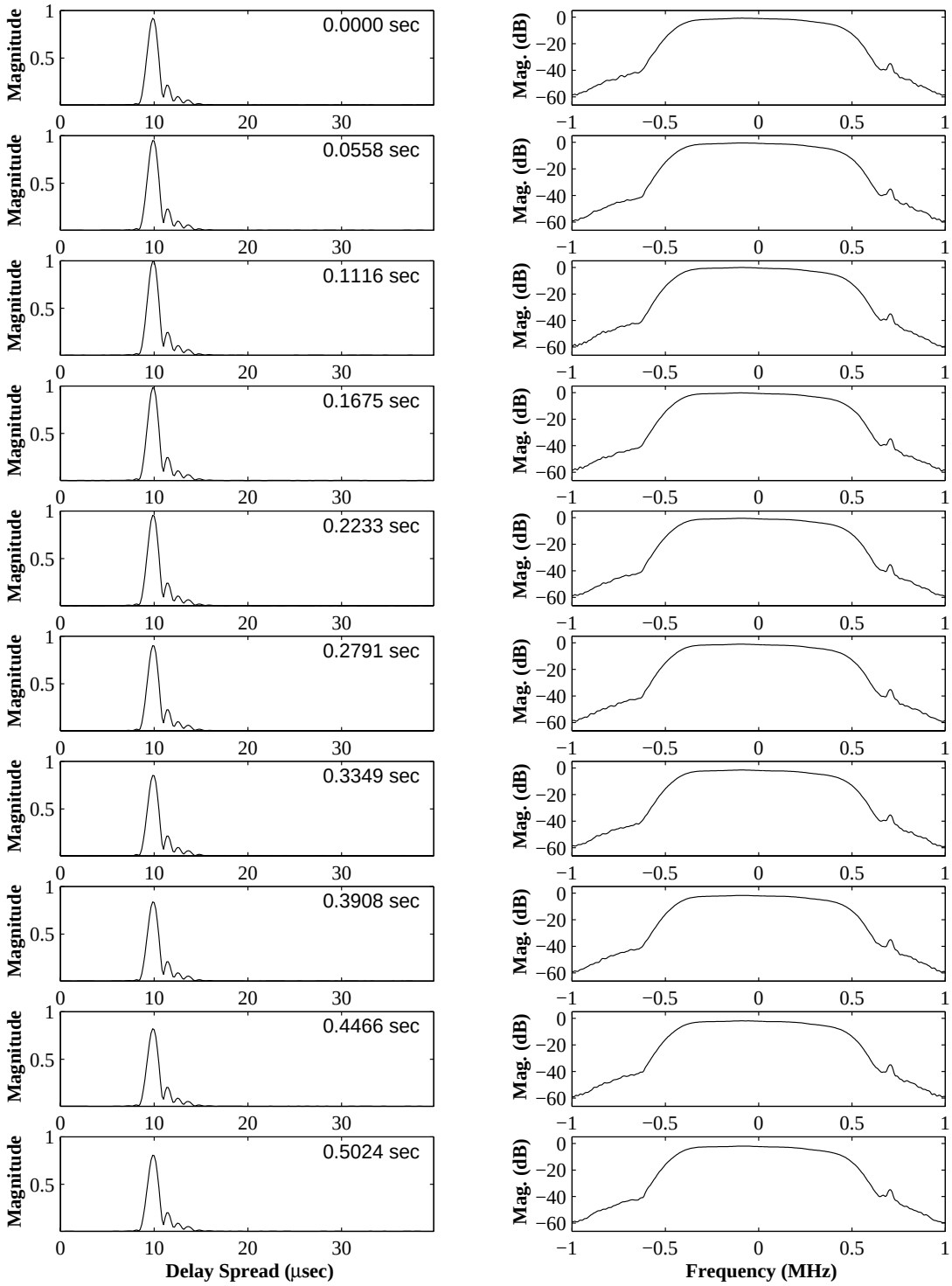

Figure 3.173: Local power delay profiles for ship22jan1757 (1).

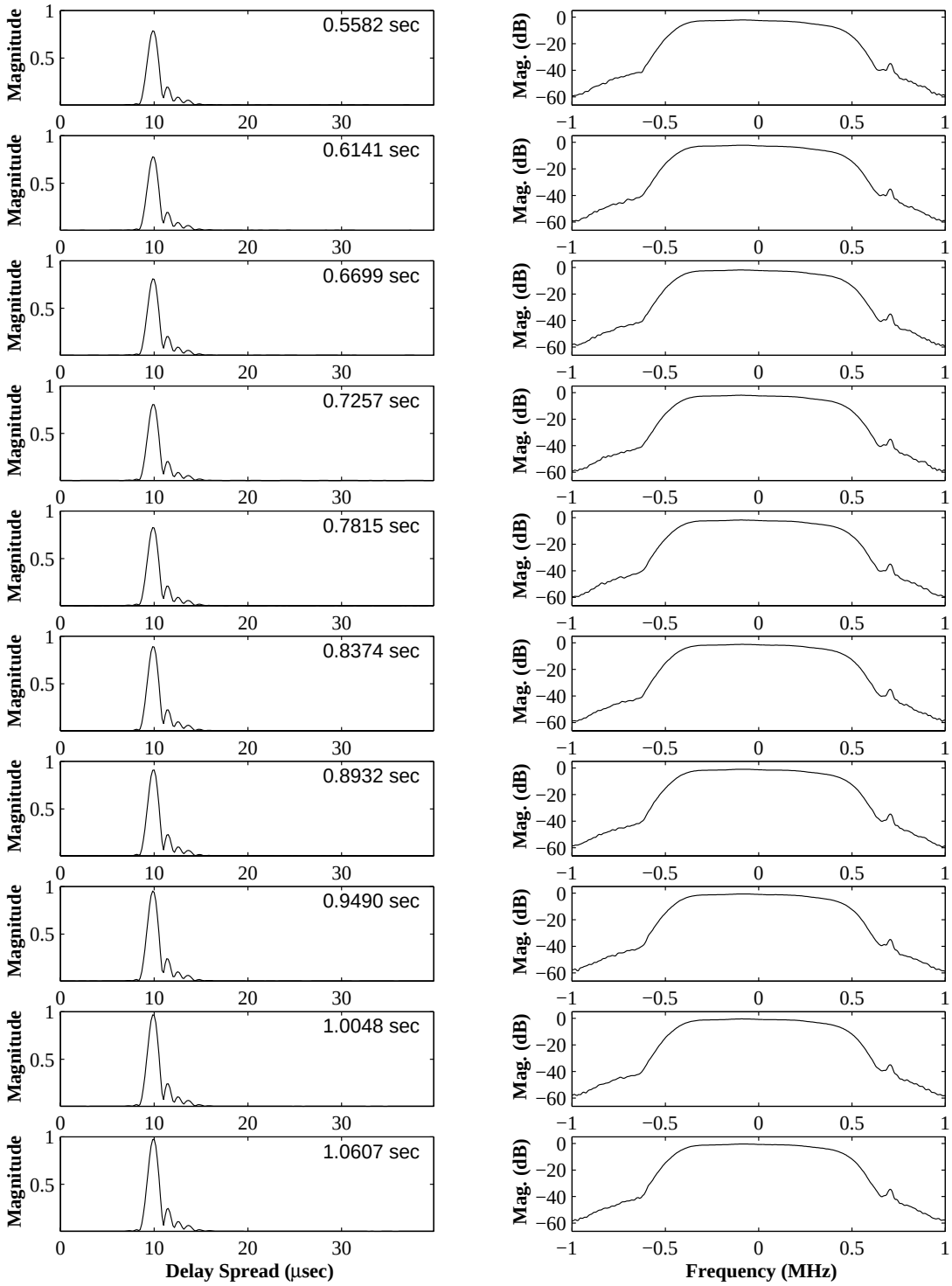

Figure 3.174: Local power delay profiles for ship22jan1757 (2).

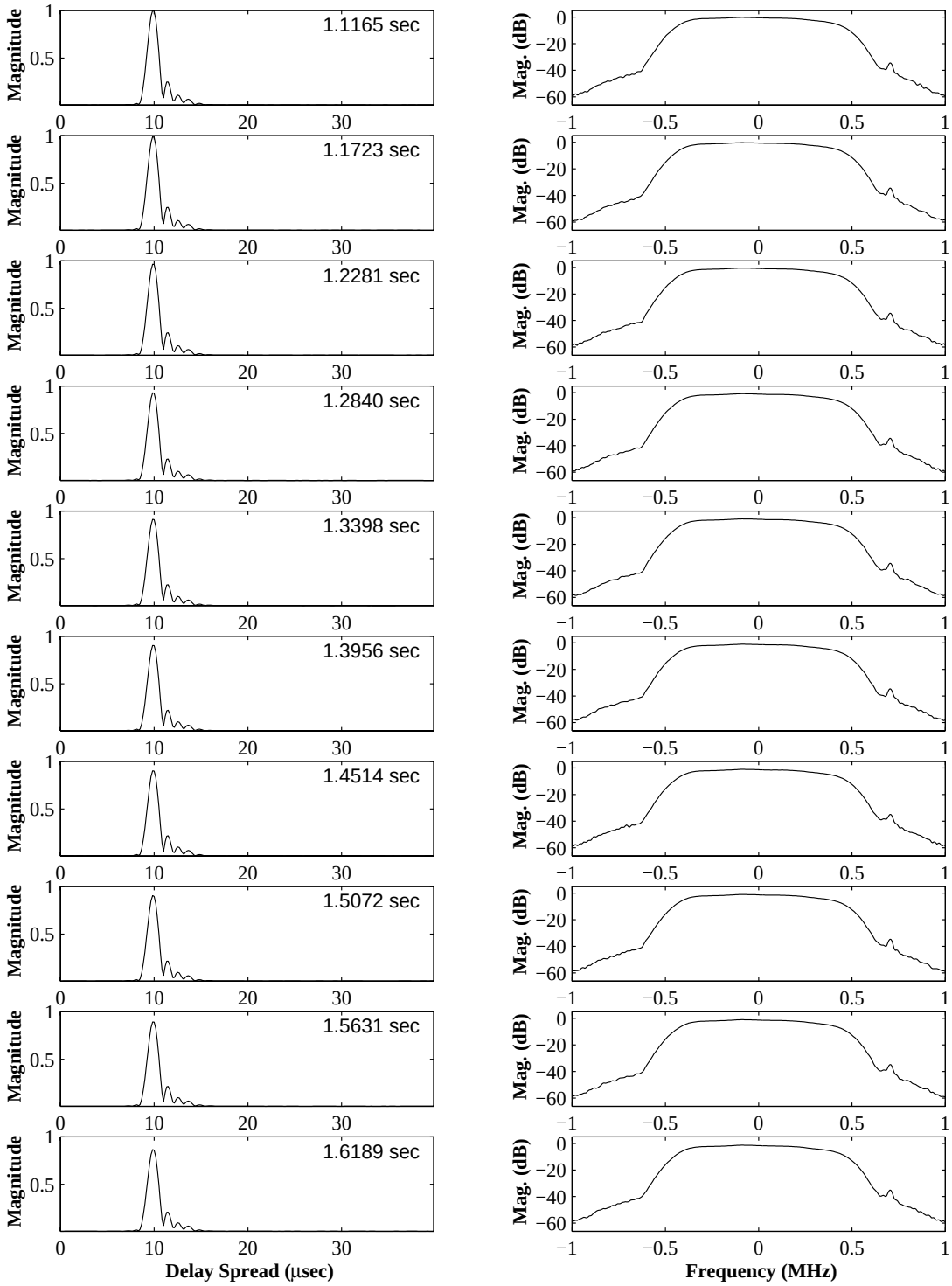

Figure 3.175: Local power delay profiles for ship22jan1757 (3).

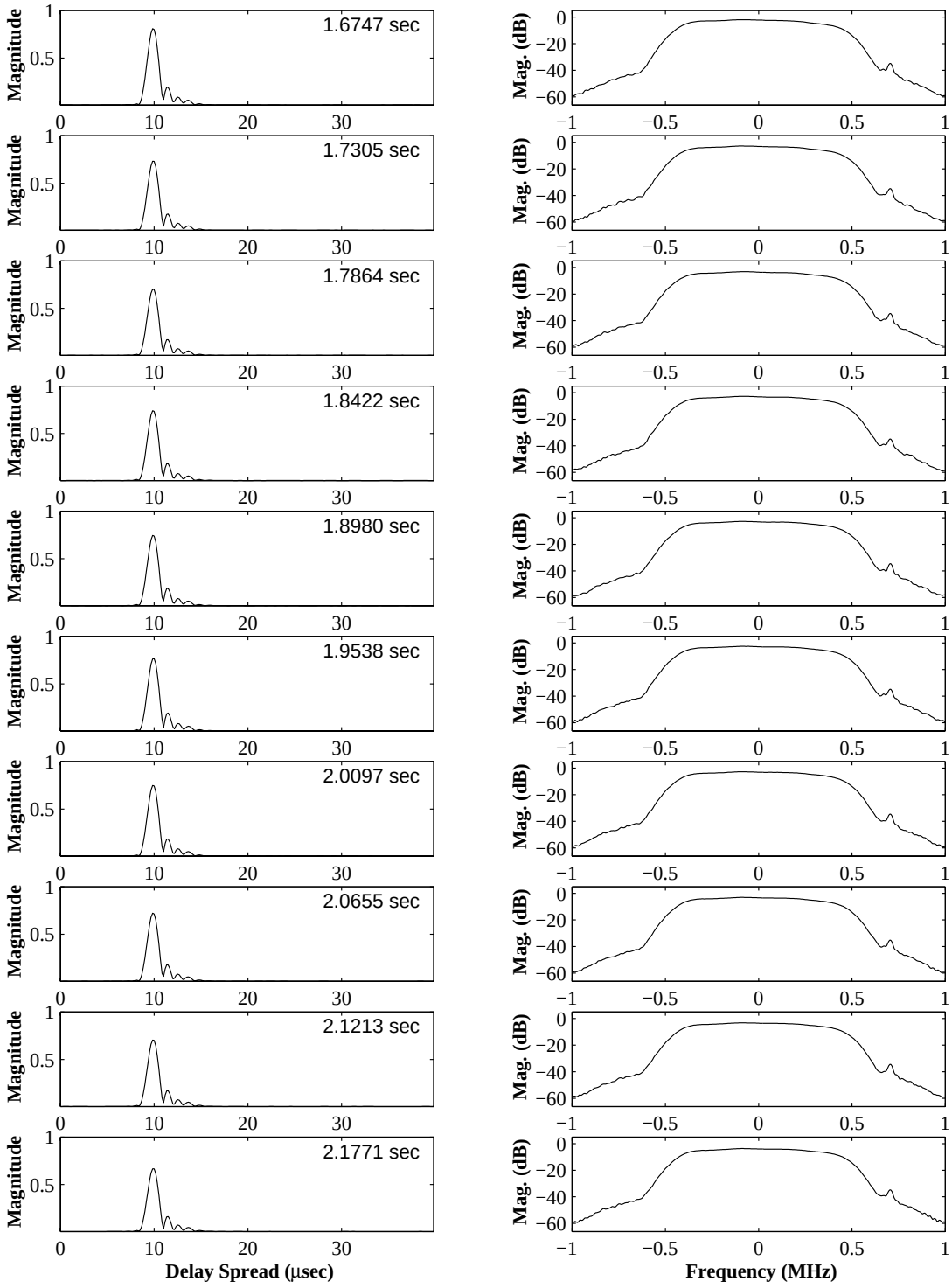

Figure 3.176: Local power delay profiles for ship22jan1757 (4).

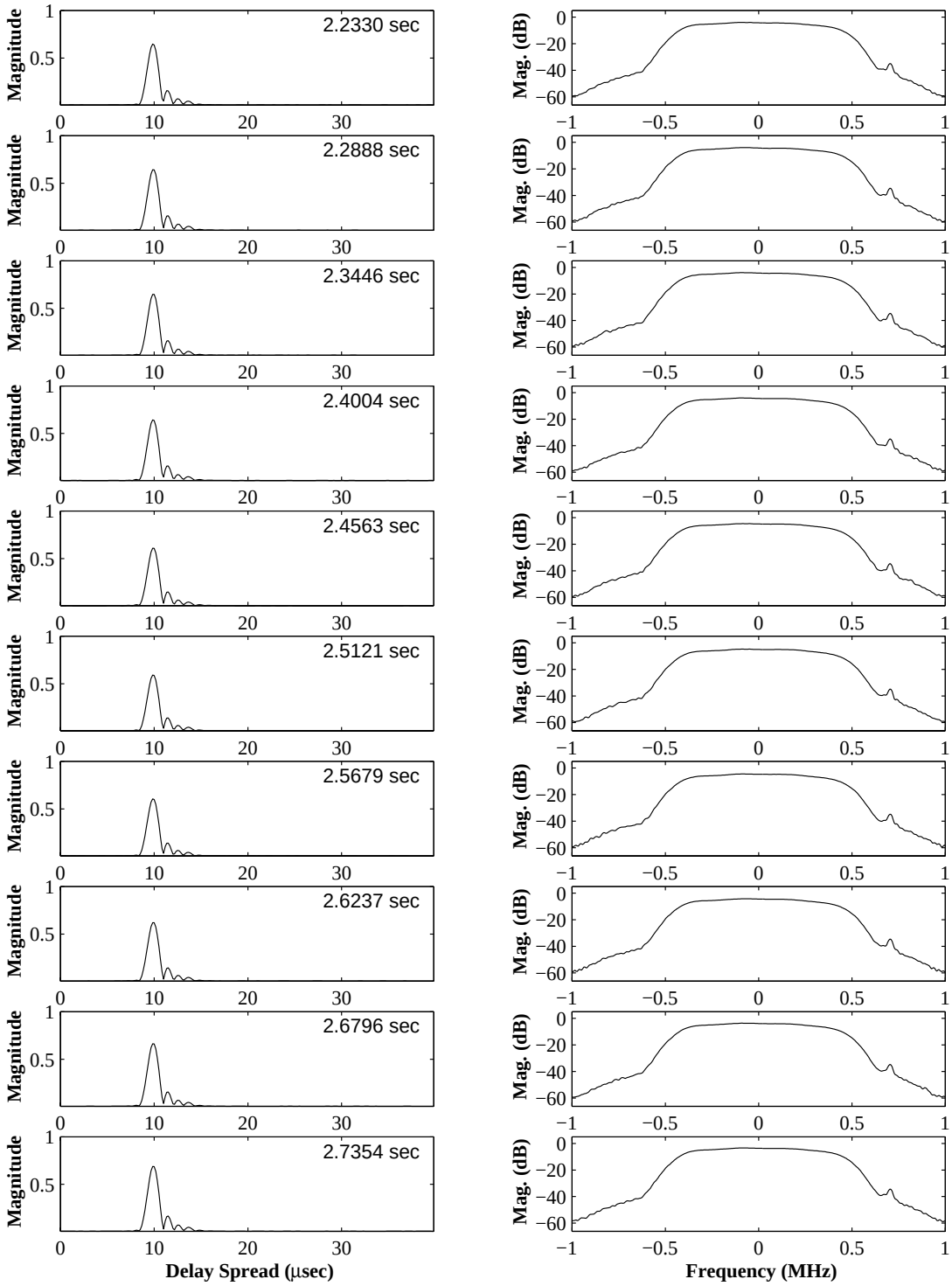

Figure 3.177: Local power delay profiles for ship22jan1757 (5).

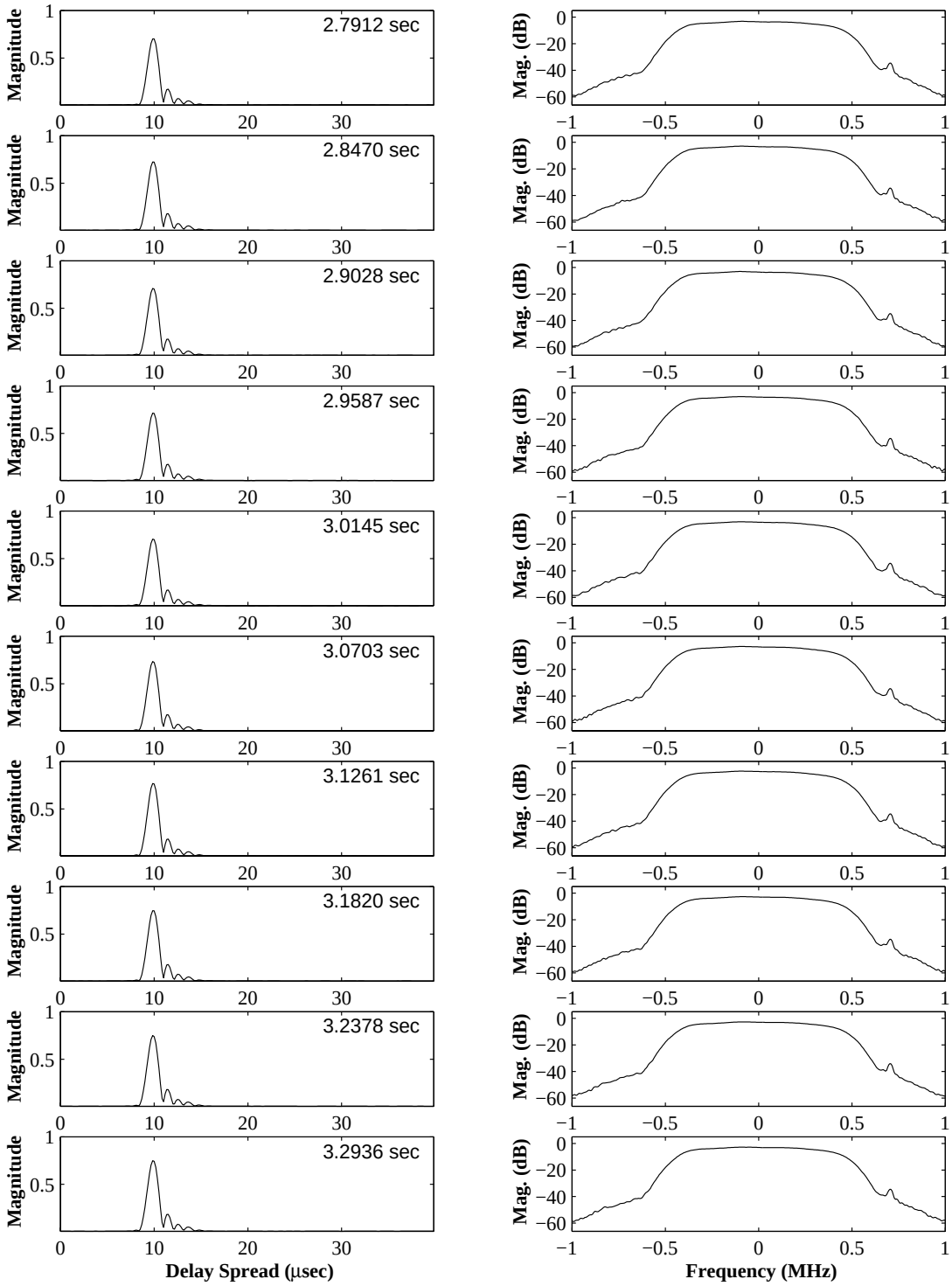

Figure 3.178: Local power delay profiles for ship22jan1757 (6).

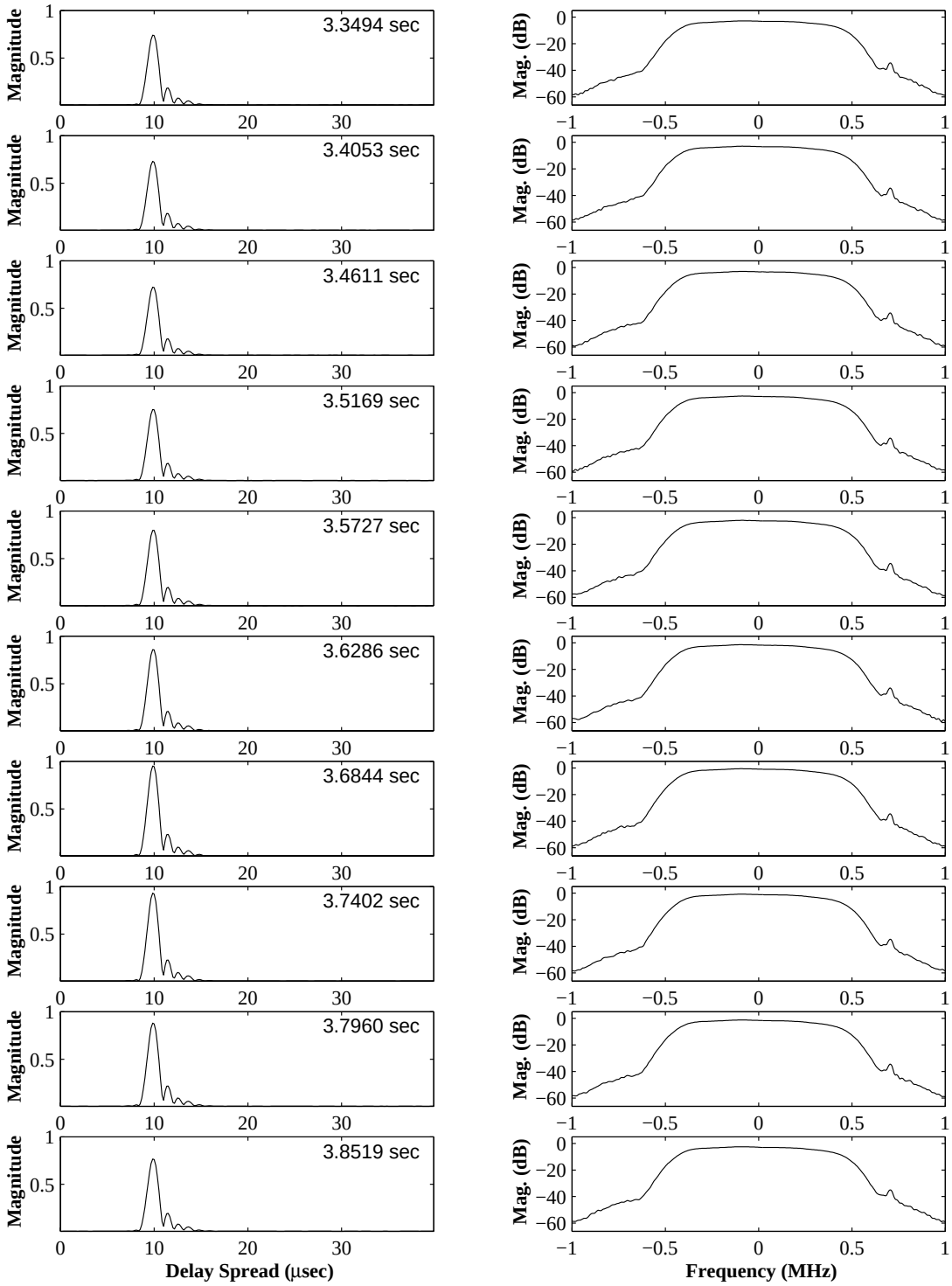

Figure 3.179: Local power delay profiles for ship22jan1757 (7).

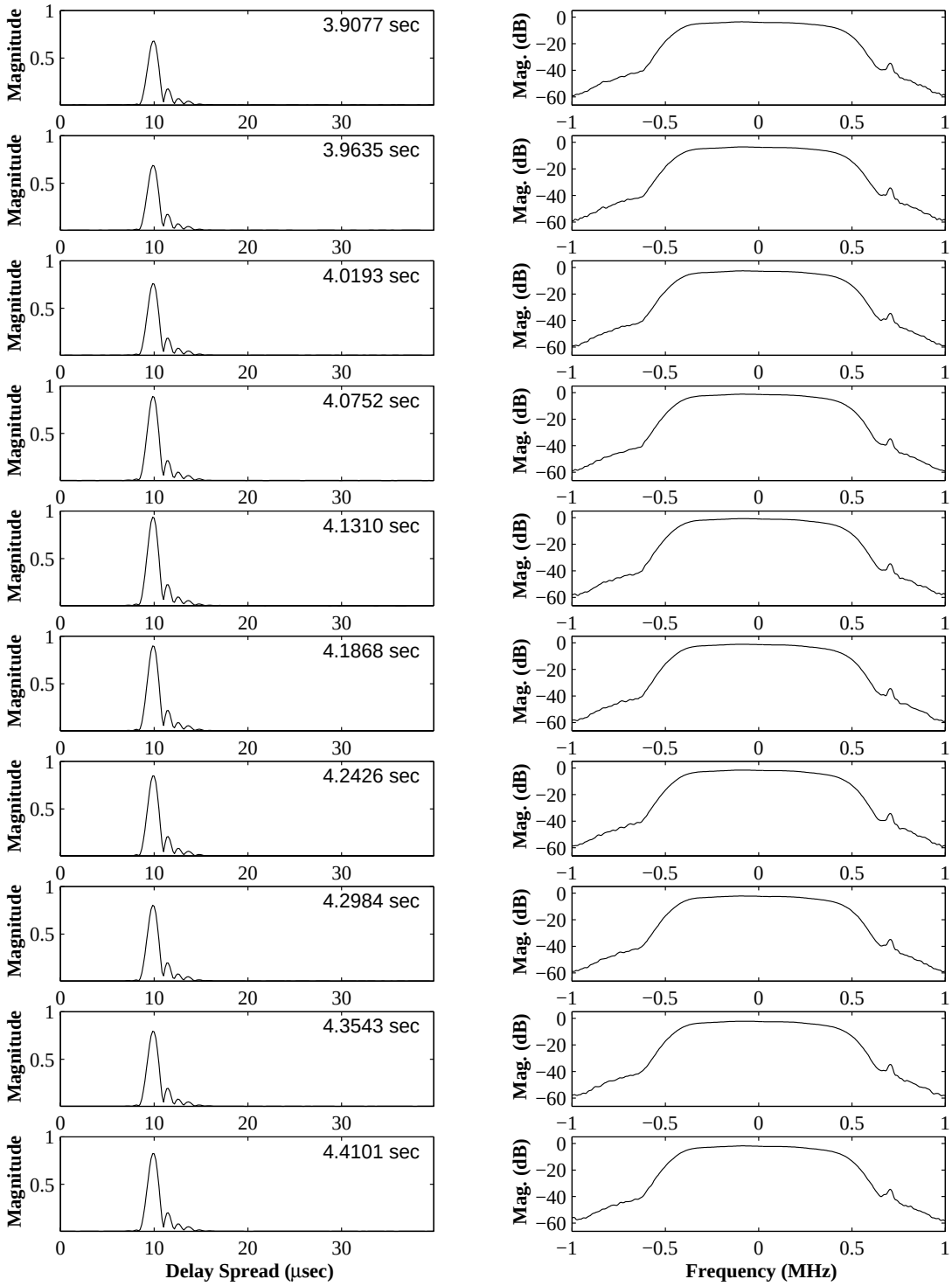

Figure 3.180: Local power delay profiles for ship22jan1757 (8).

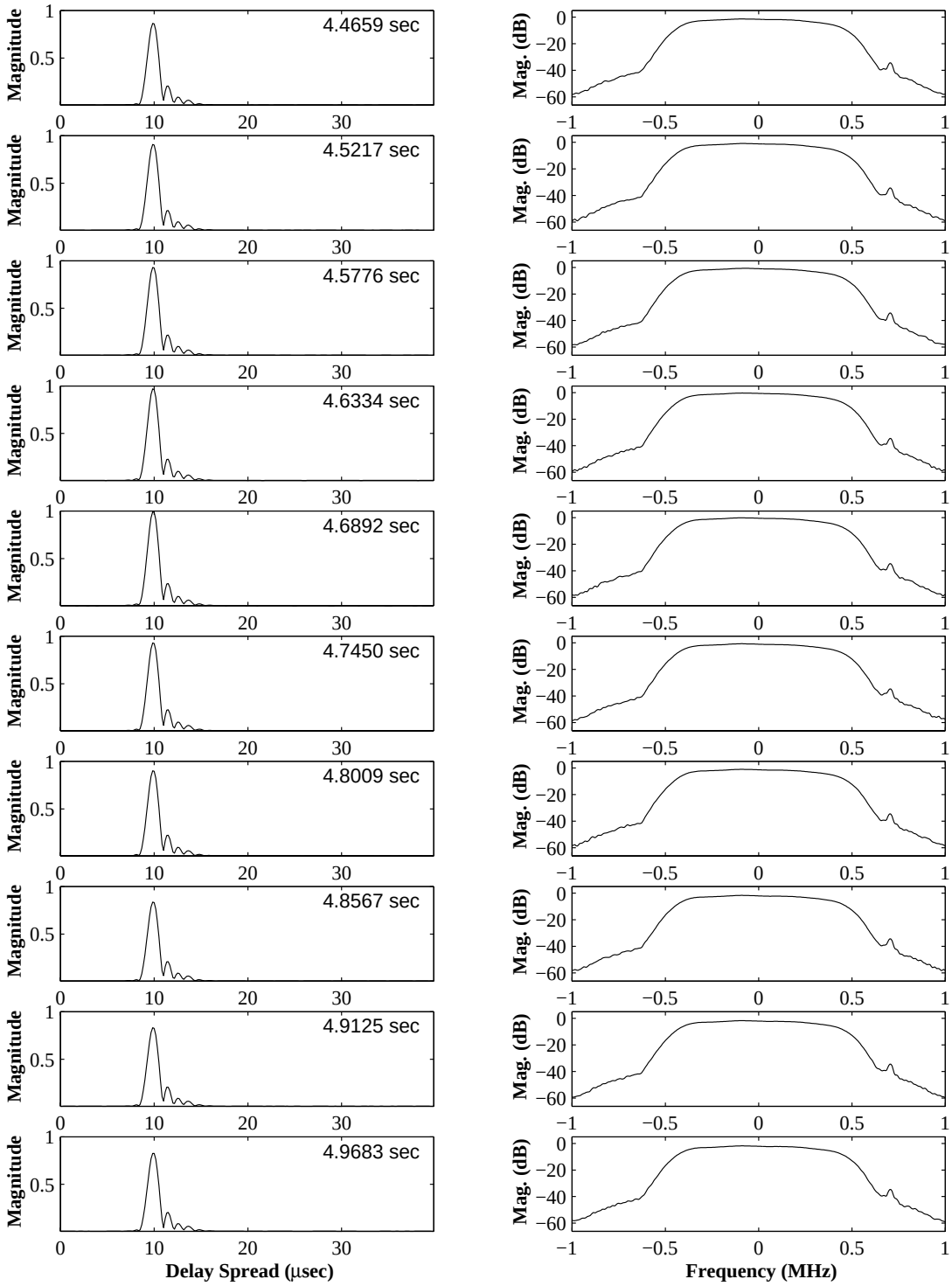

Figure 3.181: Local power delay profiles for ship22jan1757 (9).

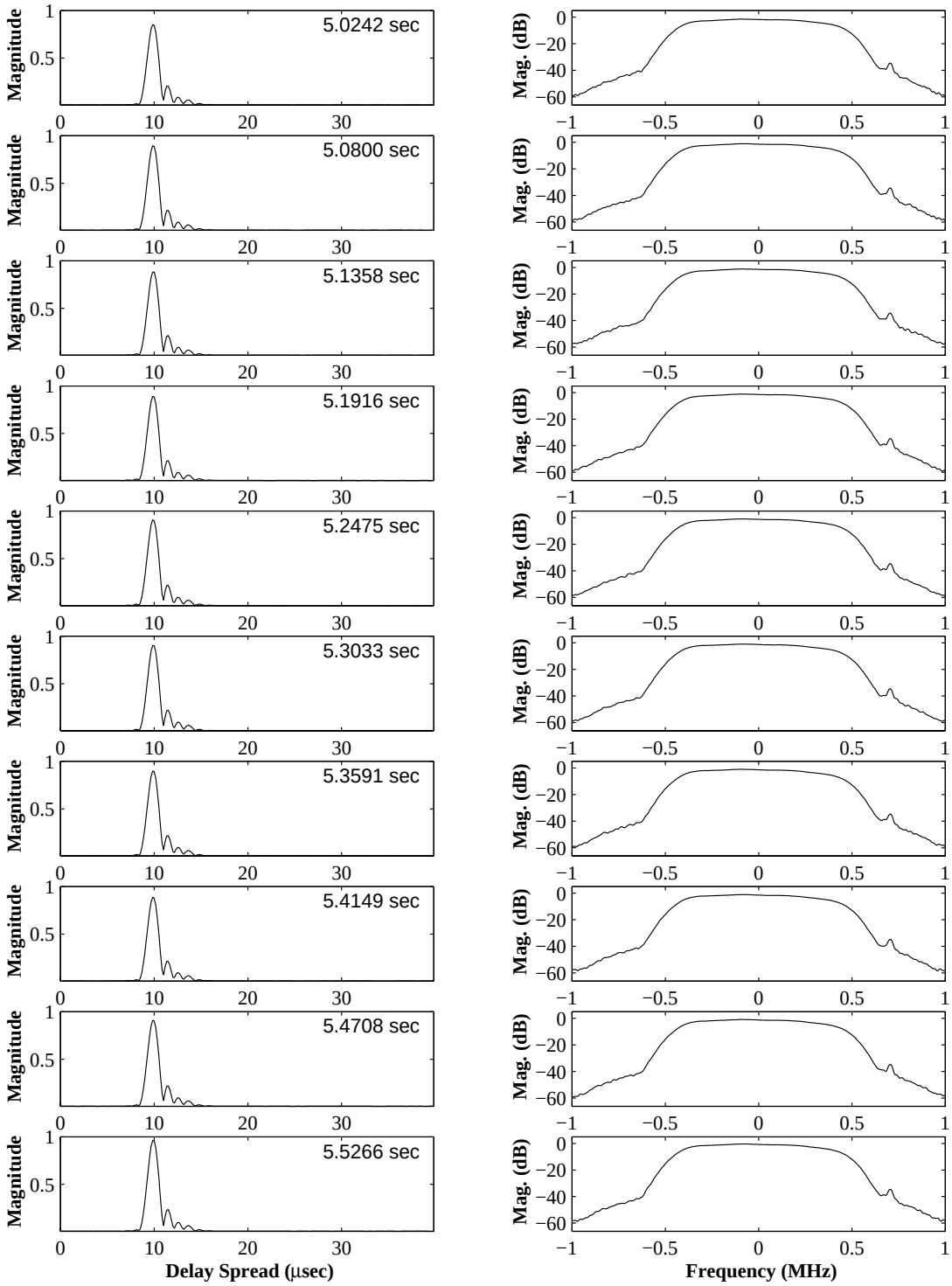

Figure 3.182: Local power delay profiles for ship22jan1757 (10).

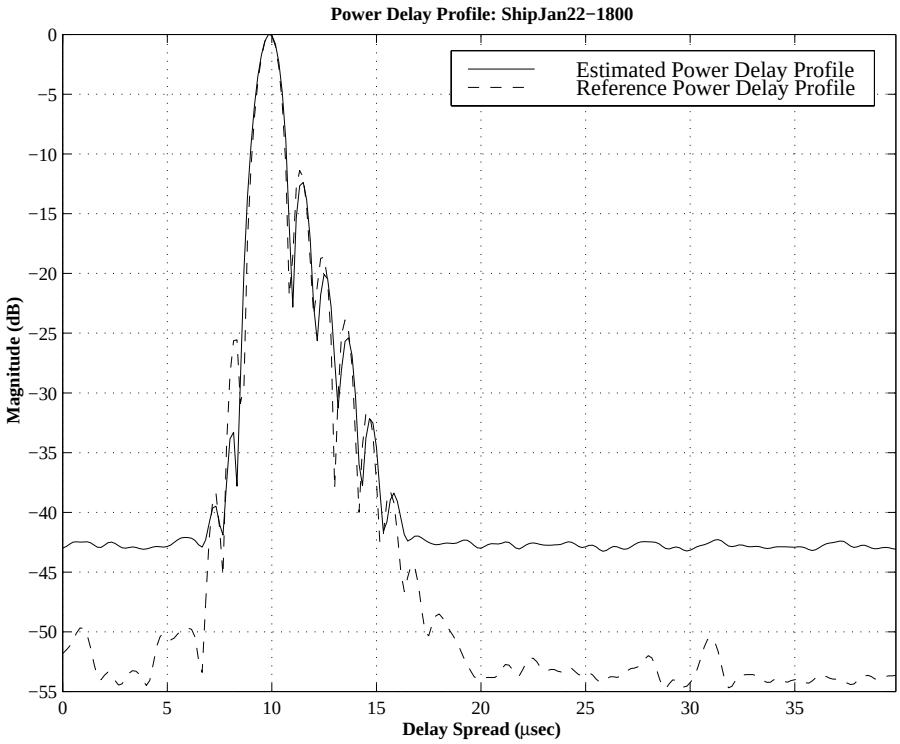

Figure 3.183: Power delay profile for ship22jan1800.

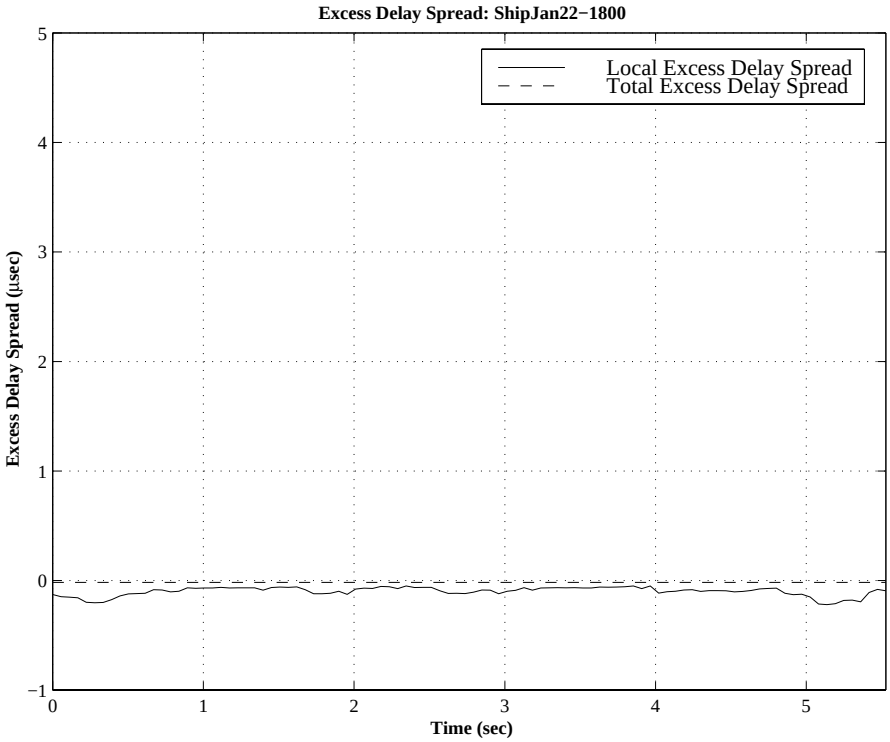

Figure 3.184: Excess delay spread for ship22jan1800.

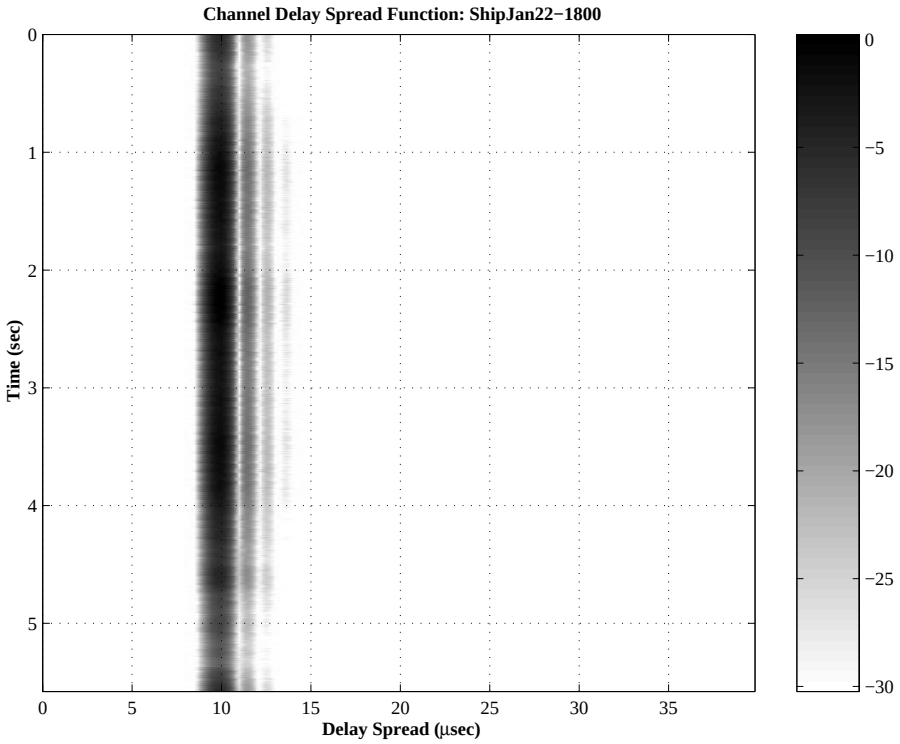

Figure 3.185: Channel delay spread function for ship22jan1800.

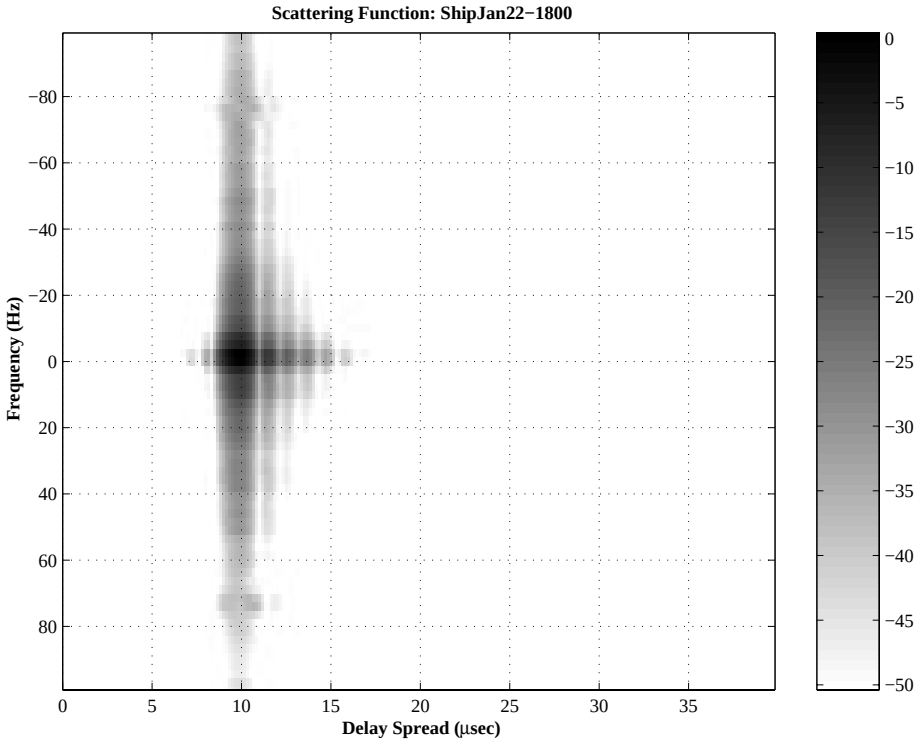

Figure 3.186: Scattering function for ship22jan1800.

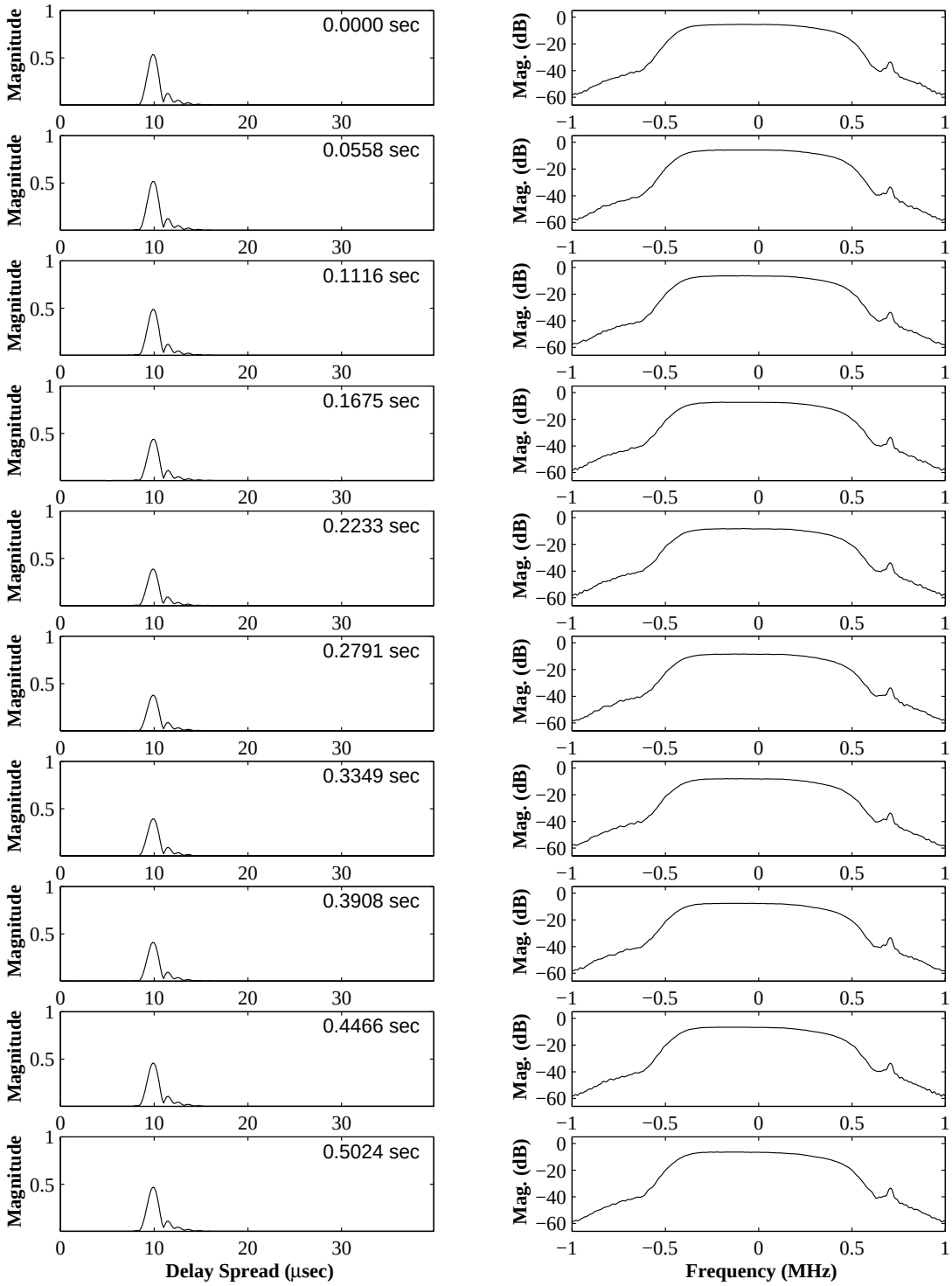

Figure 3.187: Local power delay profiles for ship22jan1800 (1).

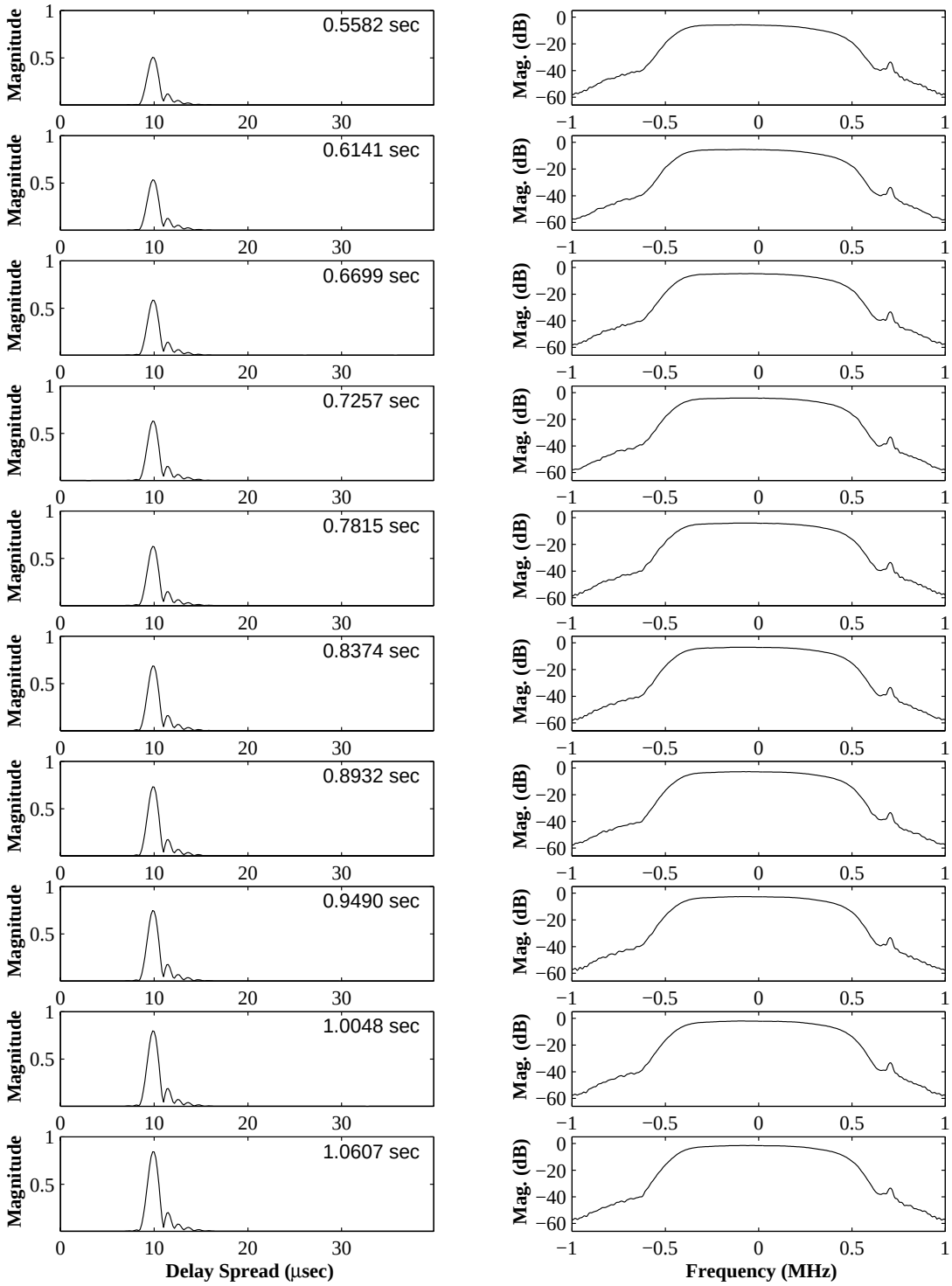

Figure 3.188: Local power delay profiles for ship22jan1800 (2).

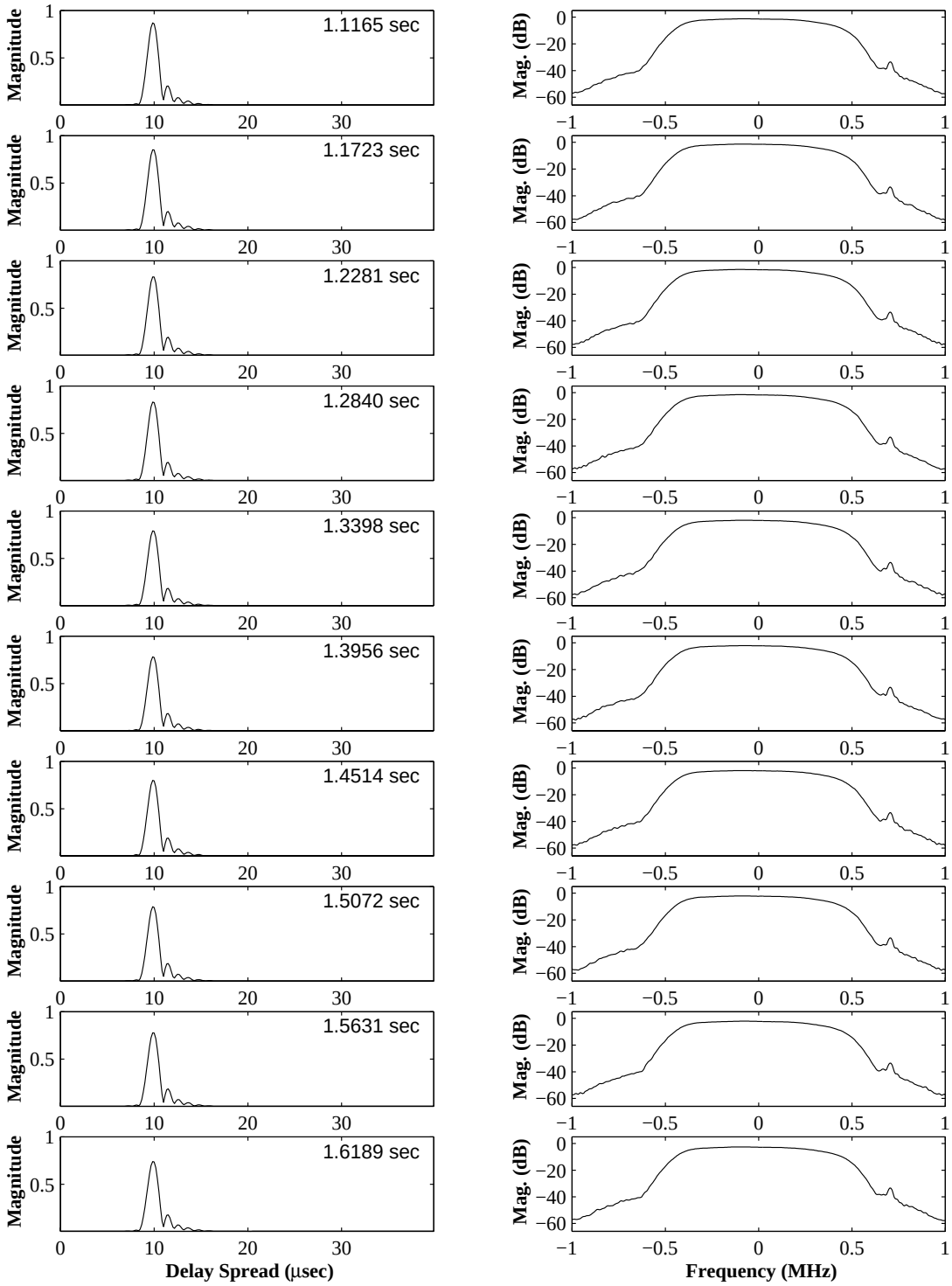

Figure 3.189: Local power delay profiles for ship22jan1800 (3).

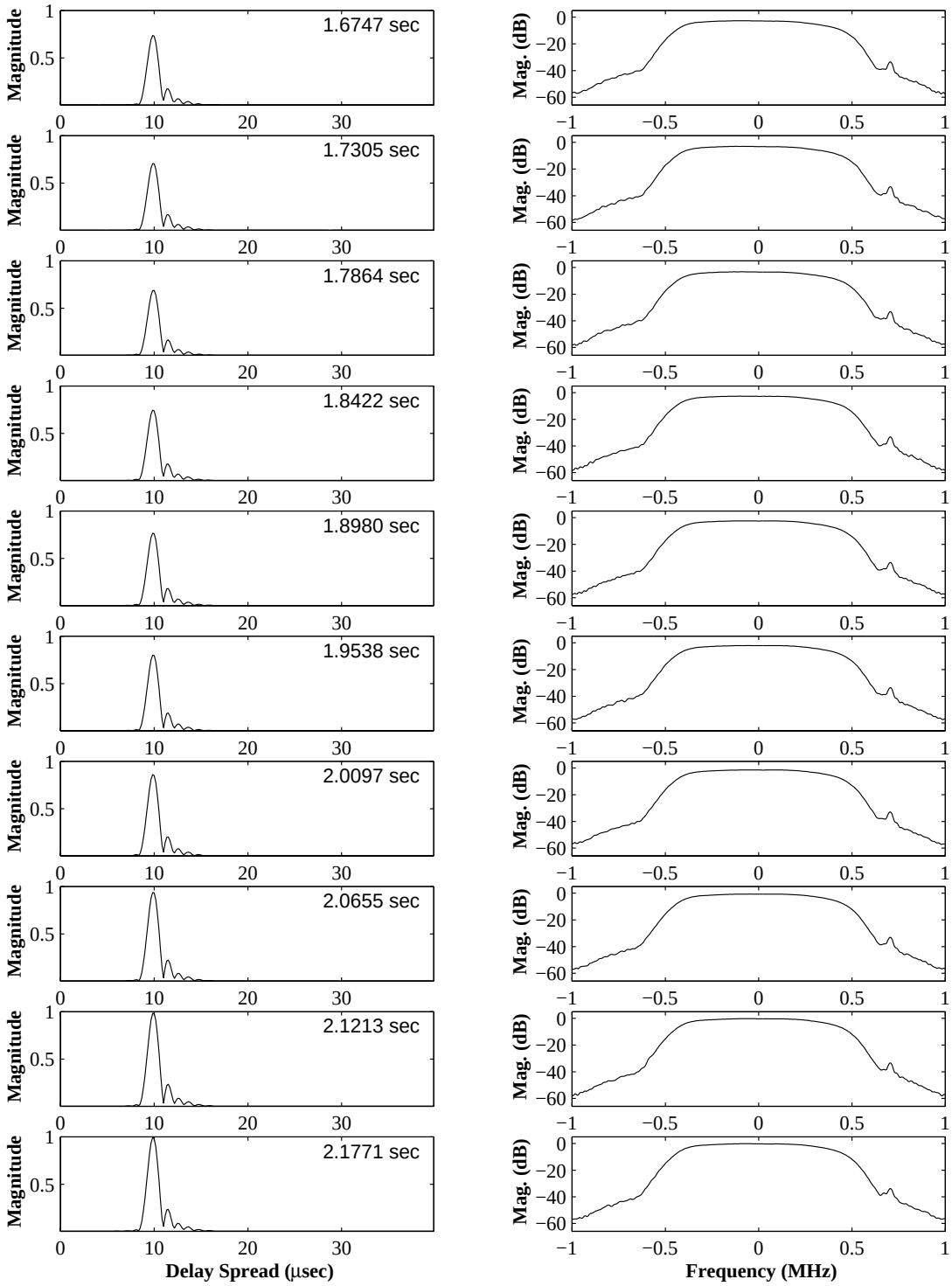

Figure 3.190: Local power delay profiles for ship22jan1800 (4).

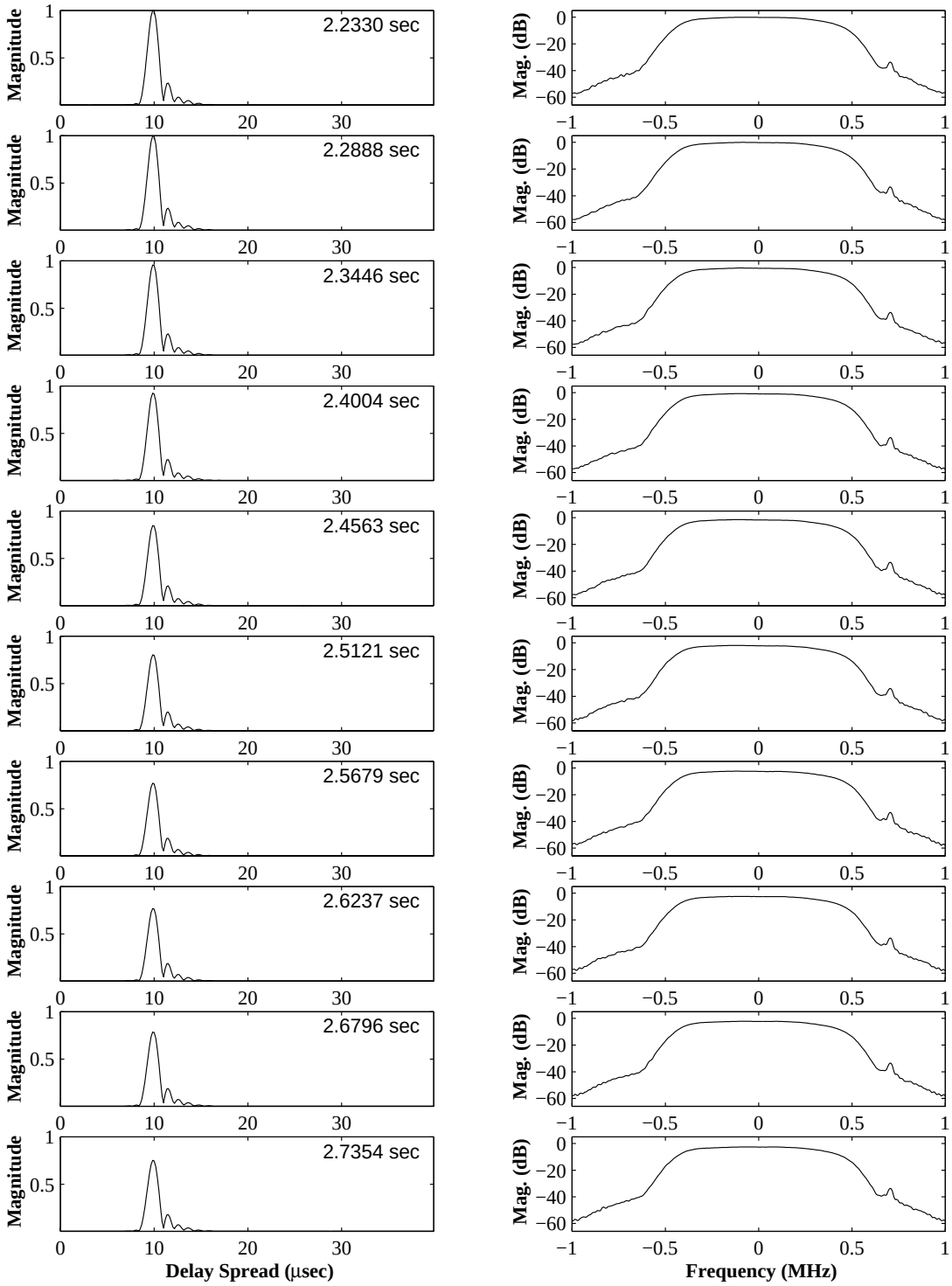

Figure 3.191: Local power delay profiles for ship22jan1800 (5).

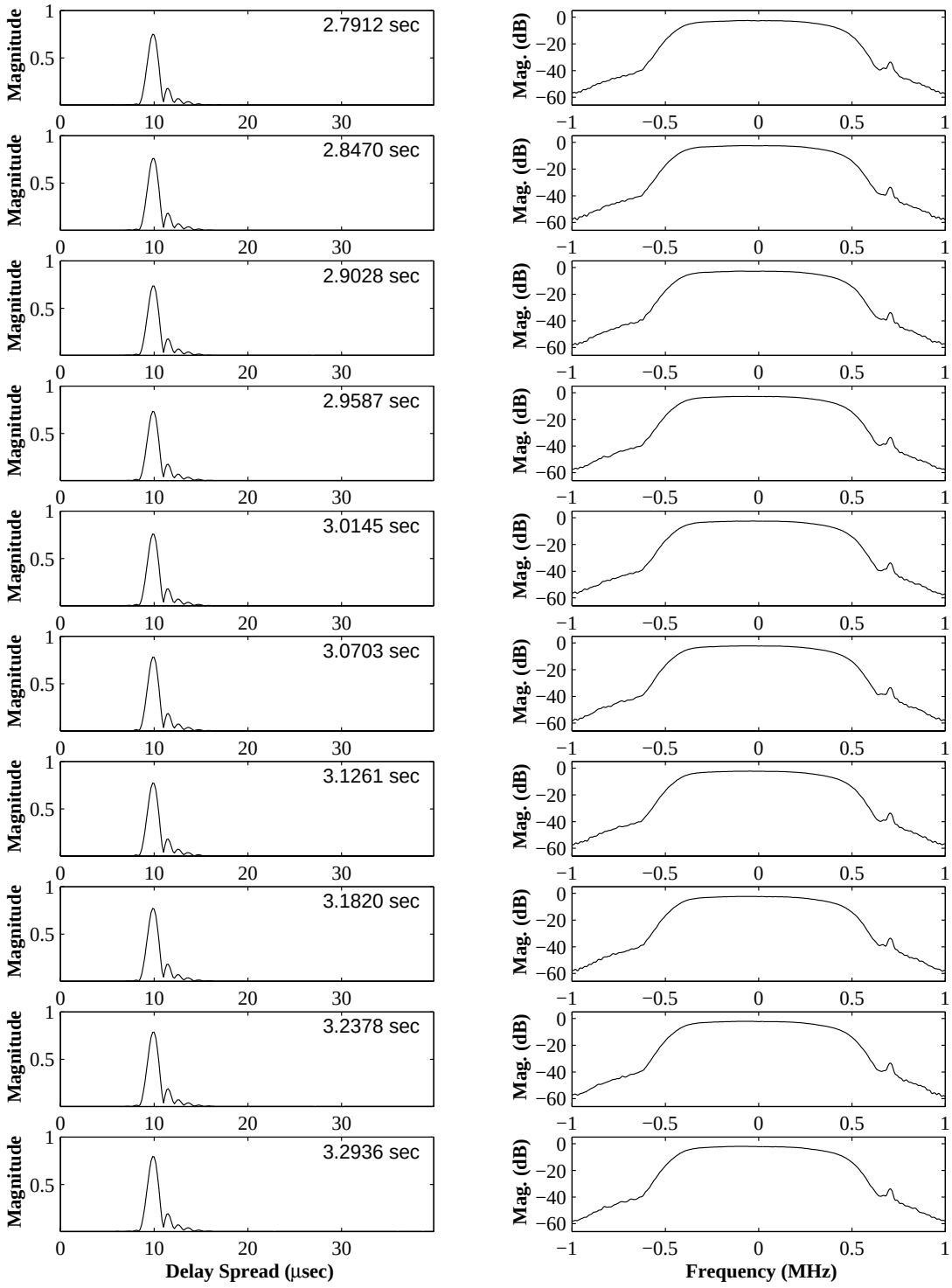

Figure 3.192: Local power delay profiles for ship22jan1800 (6).

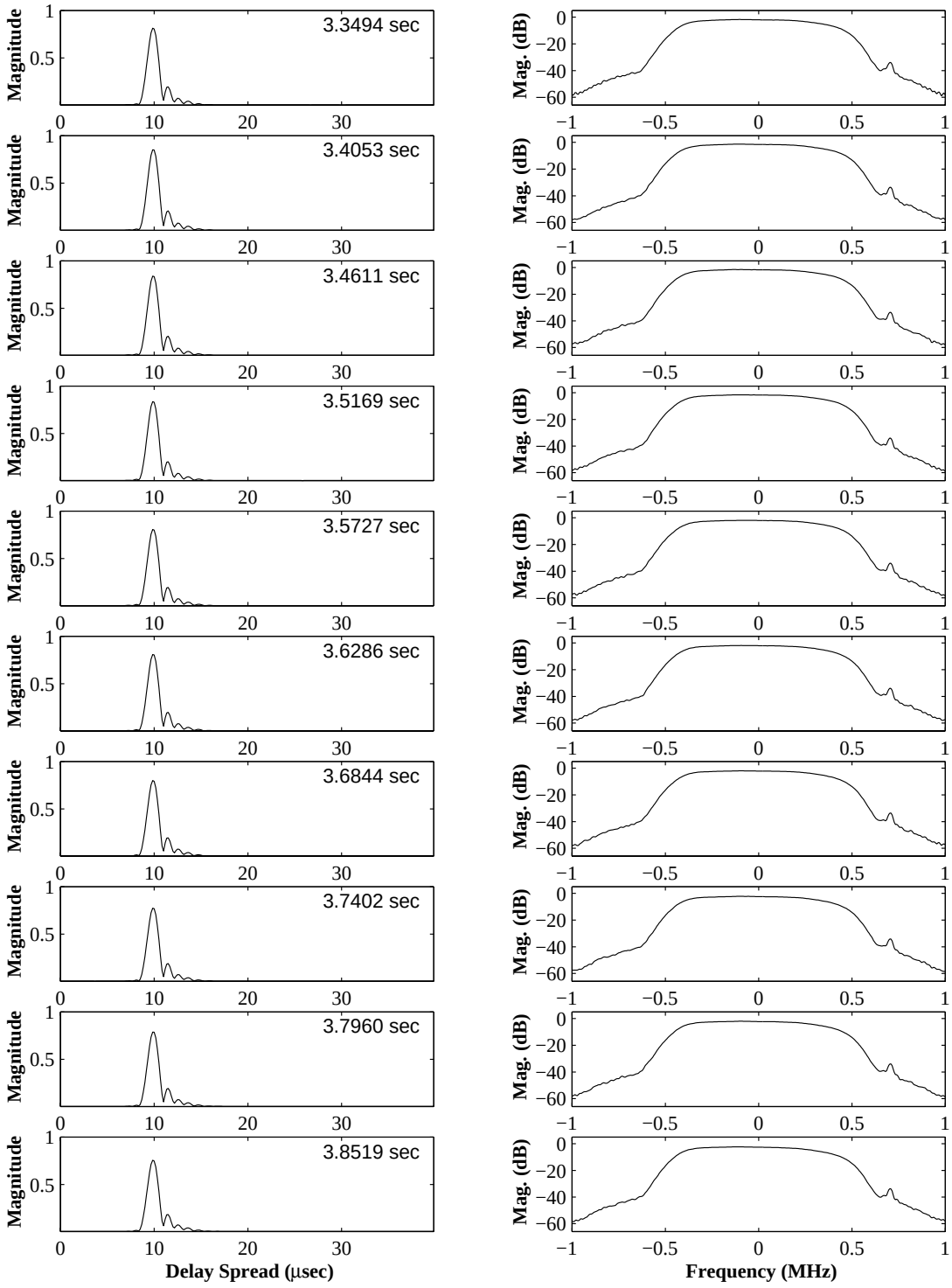

Figure 3.193: Local power delay profiles for ship22jan1800 (7).

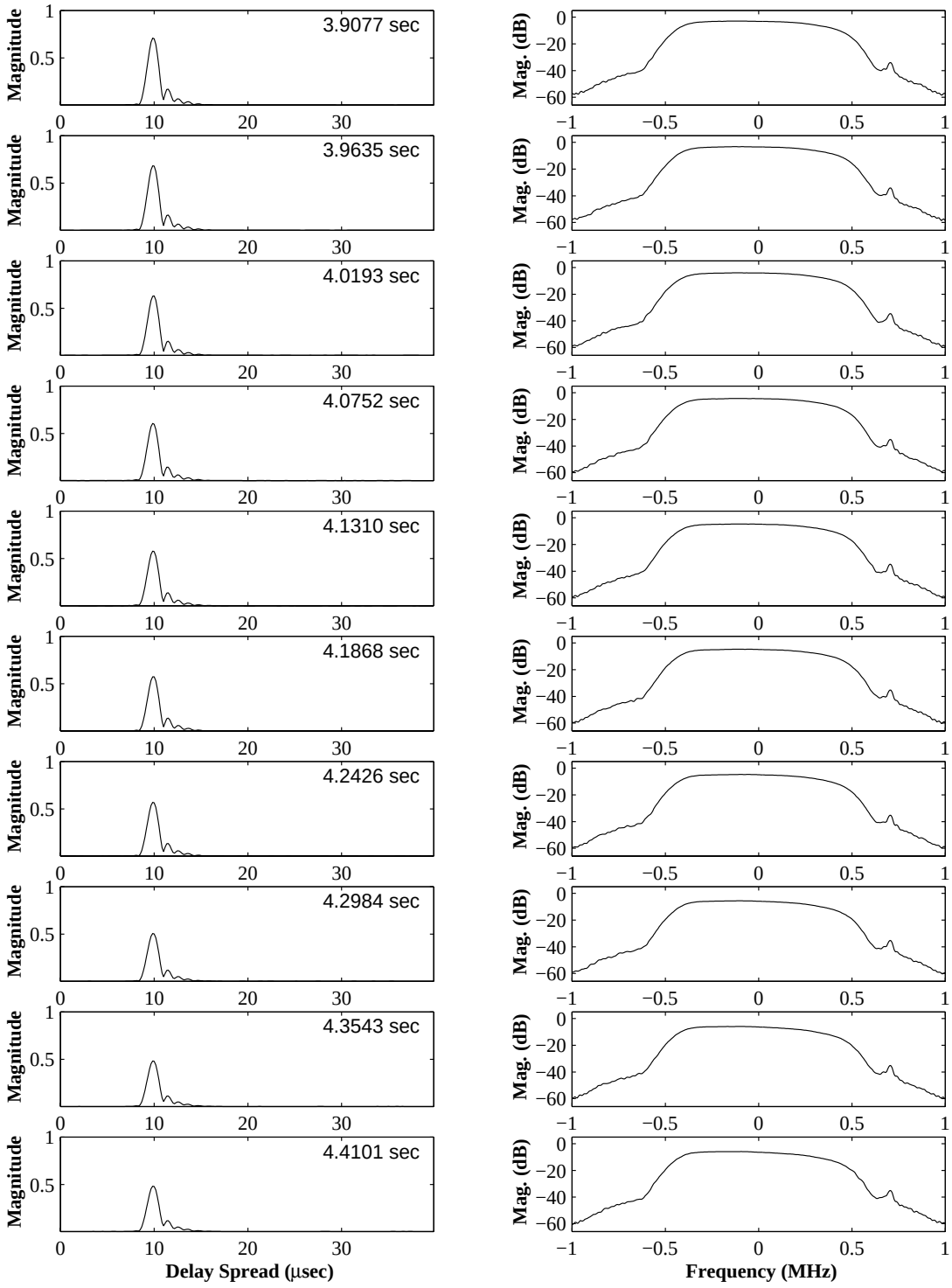

Figure 3.194: Local power delay profiles for ship22jan1800 (8).

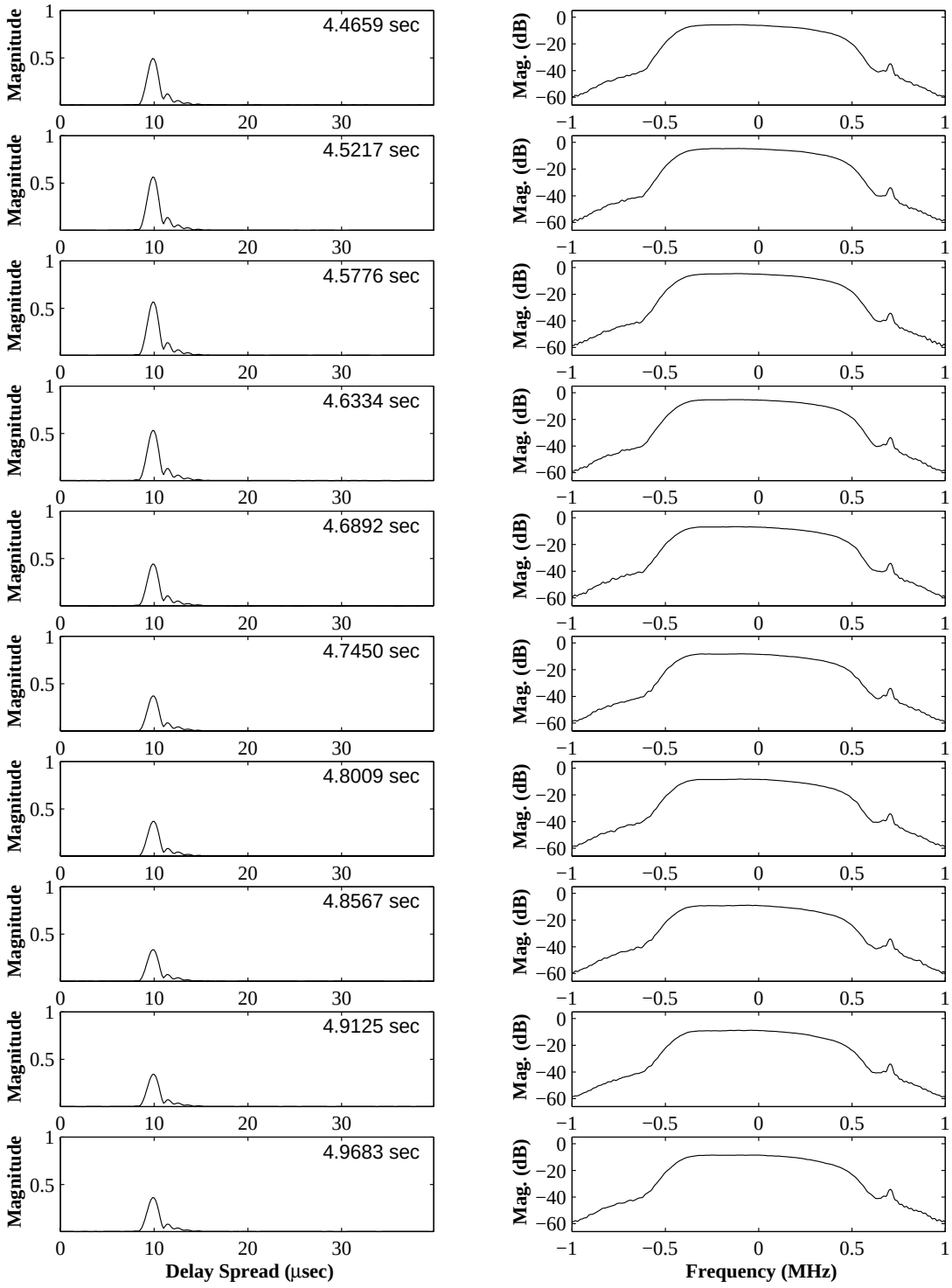

Figure 3.195: Local power delay profiles for ship22jan1800 (9).

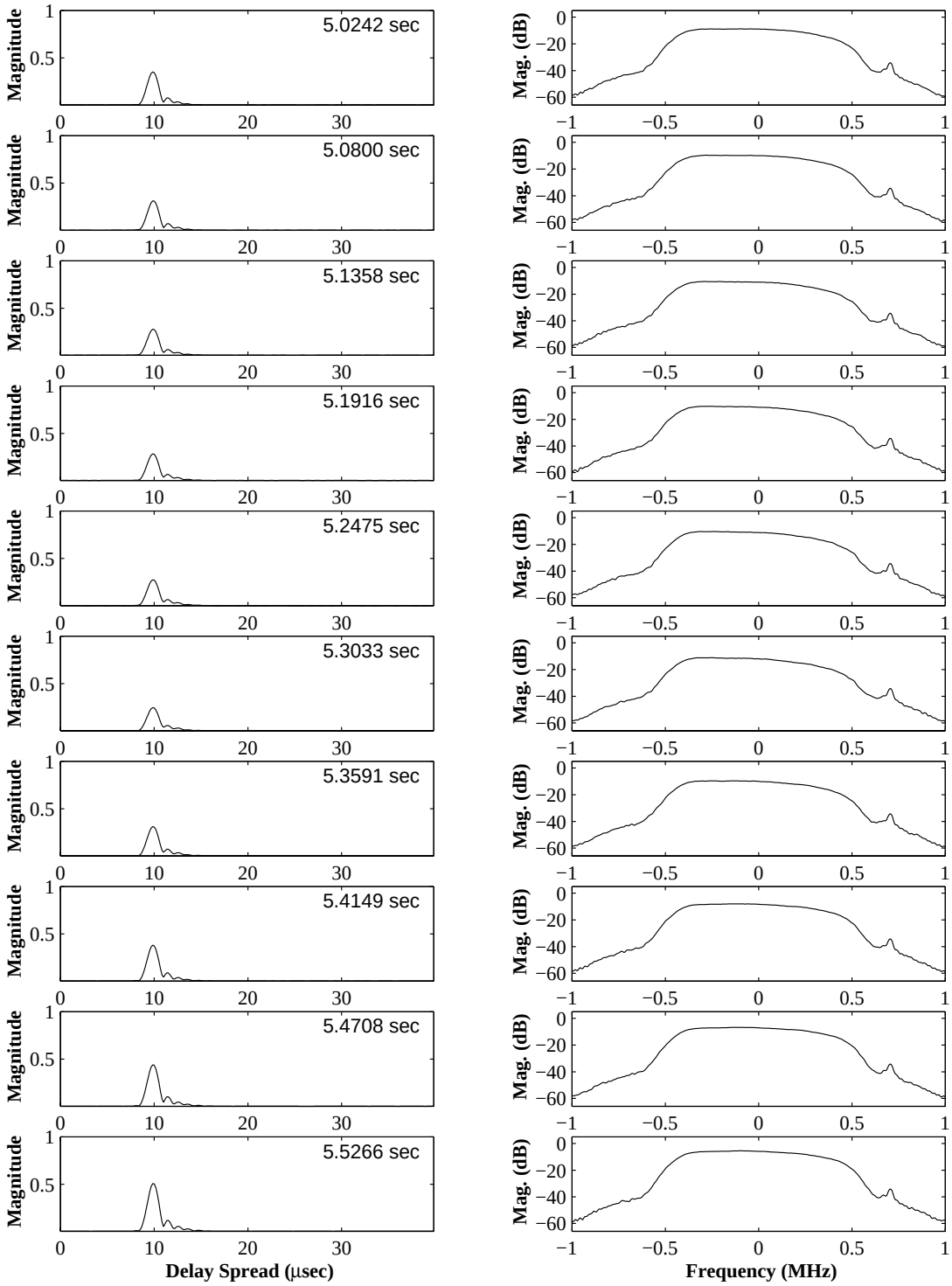

Figure 3.196: Local power delay profiles for ship22jan1800 (10).