

Fermilab Morocco Site Visit Summary

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The Hosts

Hassane and Khalid



Night Measurements



Moroccan Hospitality



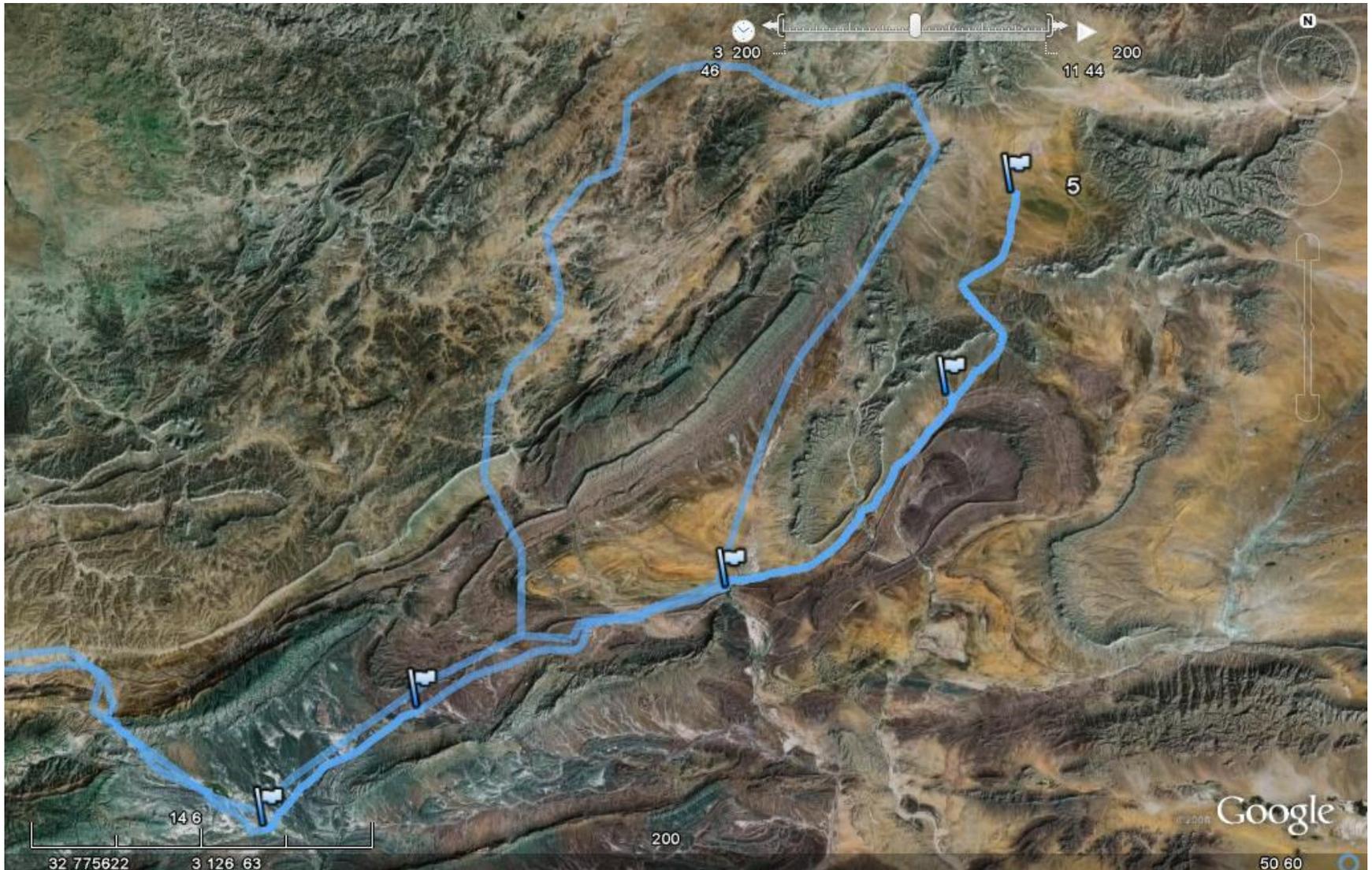
Morocco Travel Route and All Sites



Moroccan Travel Route and Measured Sites



Moroccan Desired and Actual Travel Route



Moroccan Desired and Actual Travel Route



Test Landscape



Measurements

File Name	Date	Latitude degees N	Longitude degrees W	Elevation m	Antenna	Pointing	Start Freq MHz	Stop Freq MHz	Step Freq kHz
pp8a	1/6/2009 16:55	32.60925	3.32593	1360	Discone	All	245	1255	6.25
pp5a	1/7/2009 16:54	32.79833	2.93024	1303	Discone	All	45	2055	1.5625
pp5aSS	1/7/2009 18:15	32.79833	2.93024	1303	Log Per	South	45	2055	6.25
pp5aWW	1/7/2009 19:28	32.79833	2.93024	1303	Log Per	West	45	2055	6.25
pp5aNN	1/7/2009 20:29	32.79833	2.93024	1303	Log Per	North	45	2055	6.25
pp5aEE	1/7/2009 21:23	32.79833	2.93024	1303	Log Per	East	45	2055	6.25
pp5aNE	1/7/2009 22:15	32.79833	2.93024	1303	Log Per	North East	45	2055	6.25
pp5aSE	1/7/2009 23:08	32.79833	2.93024	1303	Log Per	South East	45	2055	6.25
pp5aSW	1/8/2009 0:00	32.79833	2.93024	1303	Log Per	South West	45	2055	6.25
pp5aNW	1/8/2009 0:51	32.79833	2.93024	1303	Log Per	North West	45	2055	6.25
pp5b	1/8/2009 12:04	32.92462	2.87838	1465	Discone	All	45	2055	6.25

Normalization

$$N = \frac{P(\text{mW})}{G_{\text{amp}} R_{\text{bw}} \left(\frac{c}{f} \right)^2 \frac{D}{4\pi} \frac{1000 \text{ mW}}{W}}$$

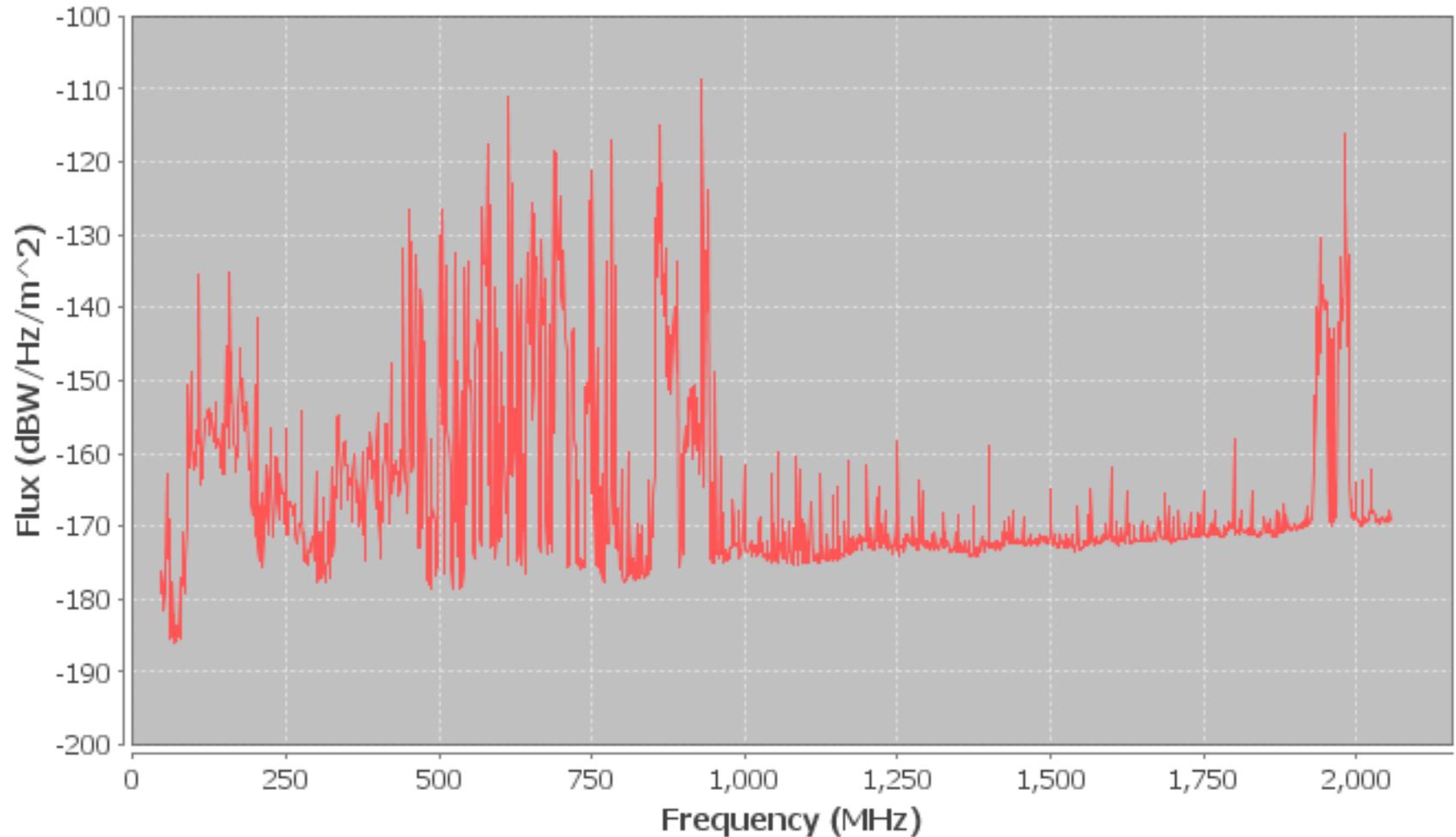
G_{amp} = Amplifier Gain x Cable Loss

R_{bw} = Resolution Bandwidth of the spectrum (25kHz)

$\left(\frac{c}{f} \right)^2 \frac{D}{4\pi}$ = Area of the antenna
D=2dBi (Discone)
D=11dBi(Log Periodic) (~5dB half space)

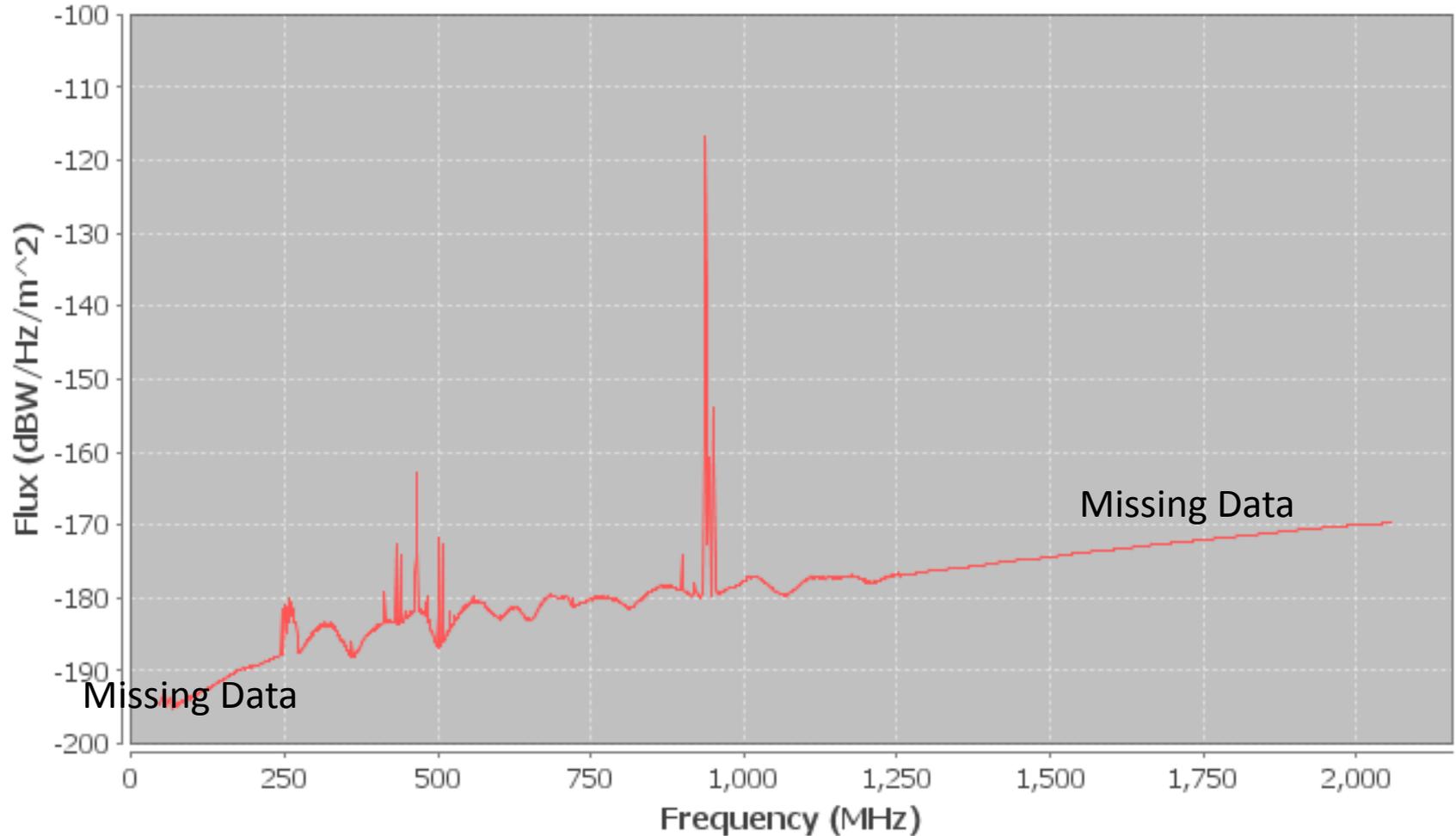
Fermilab Discone

FermilabDisconeNorm.dat



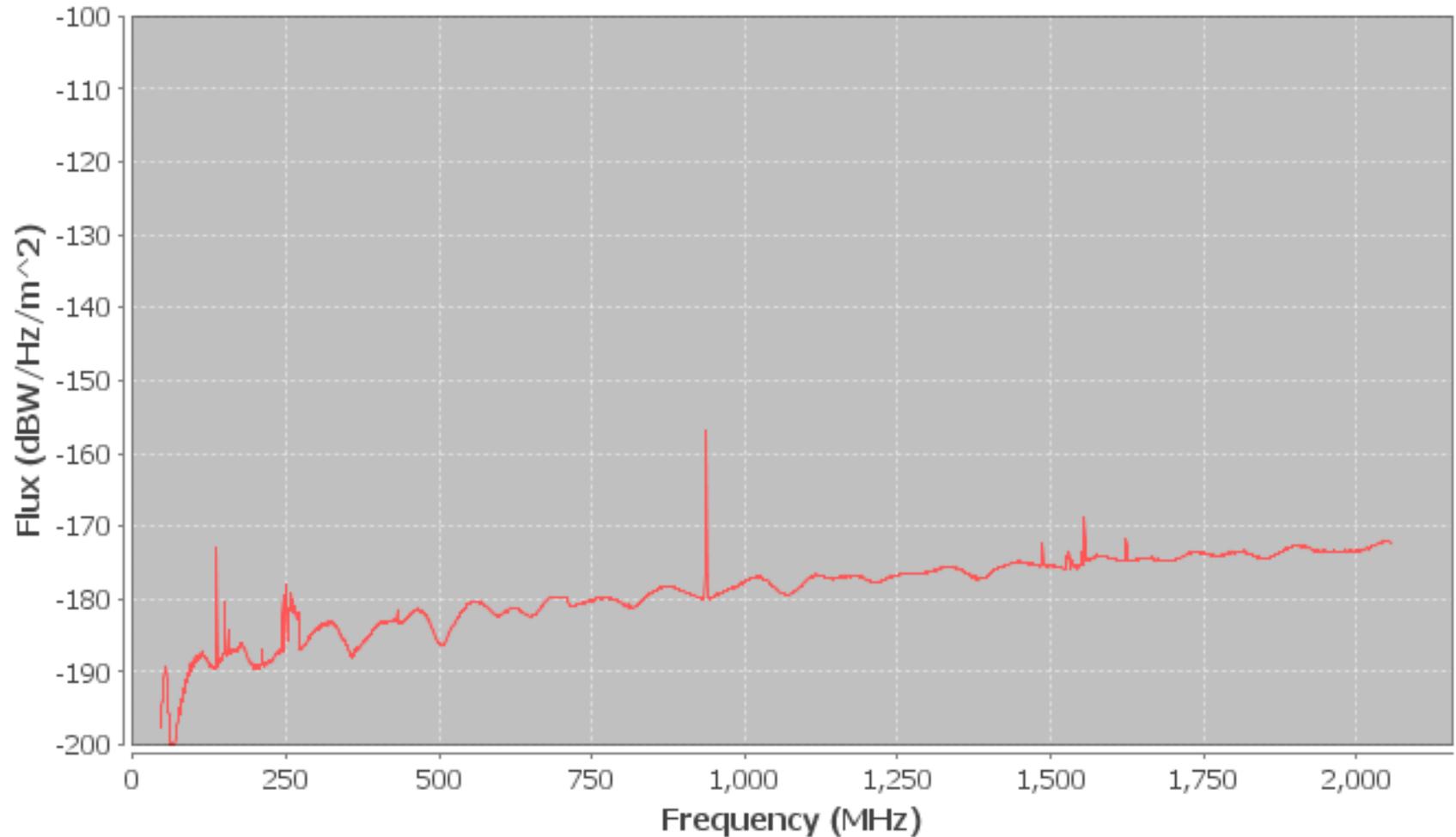
Site 8a Discone

pp8aNorm.dat



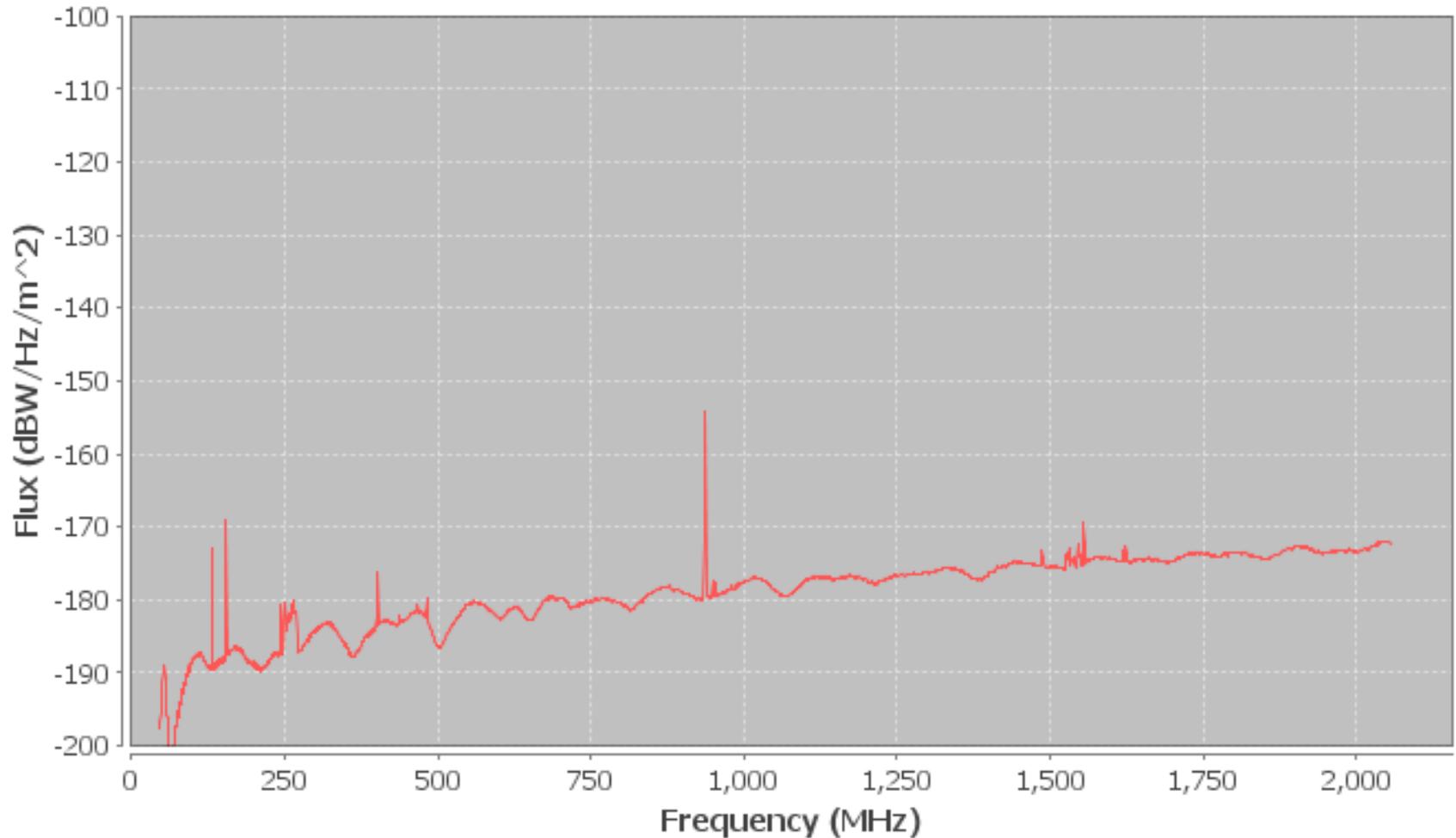
Site 5a Discone

pp5aNorm.dat



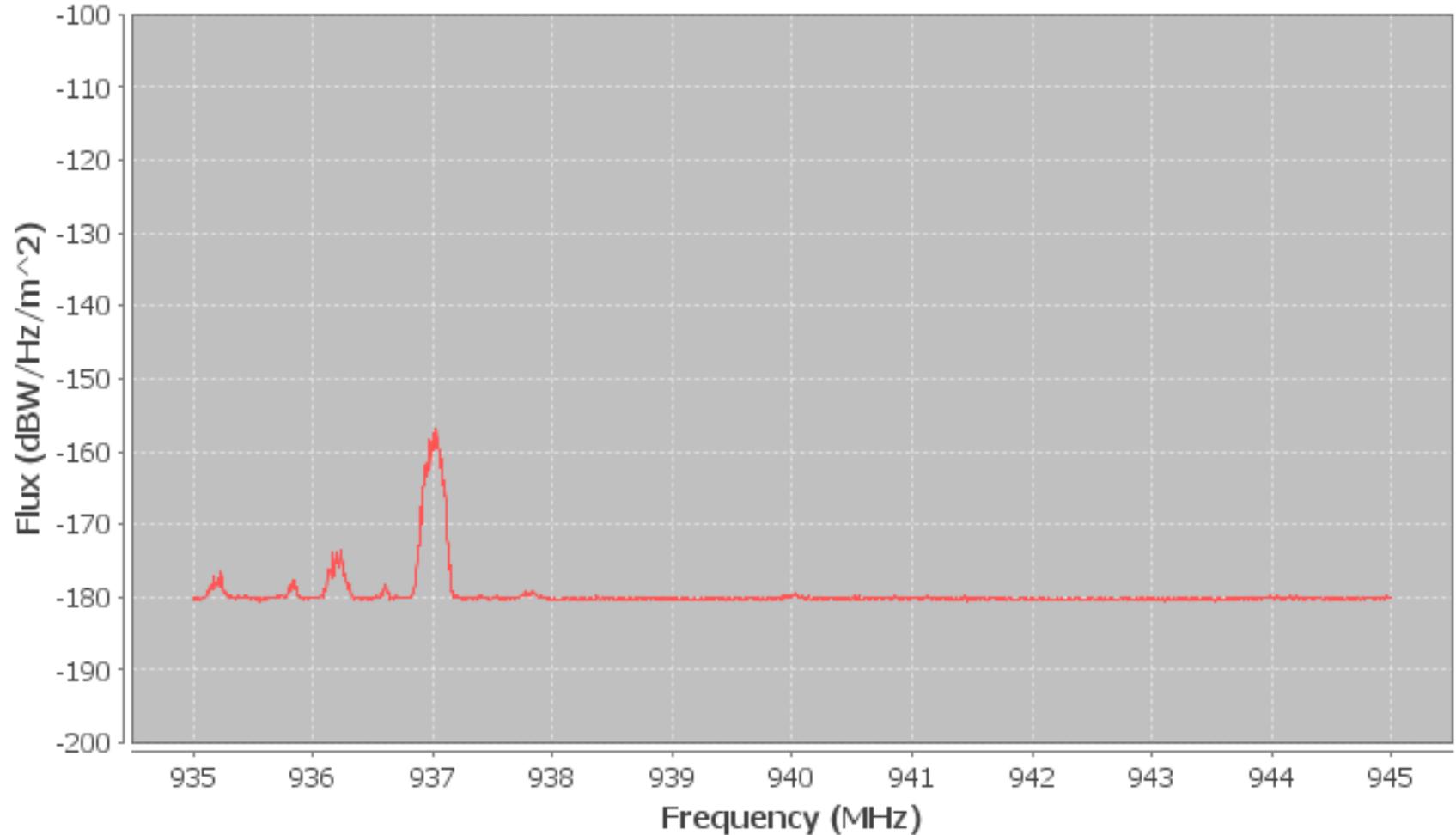
Site 5b Discone

pp5bNorm.dat



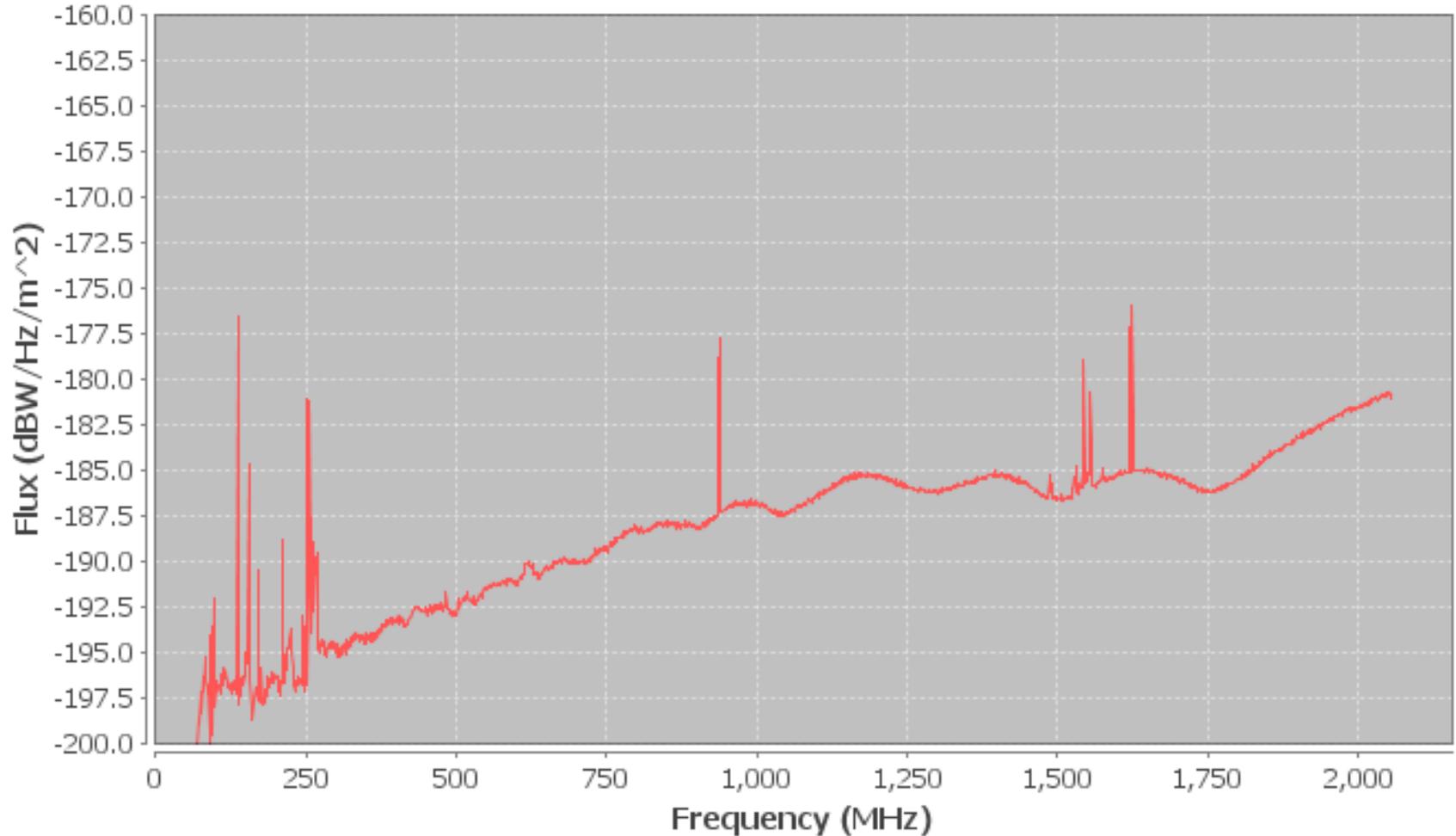
Site 5a Discone at 940 MHz

Zoomed pp5aNorm.dat



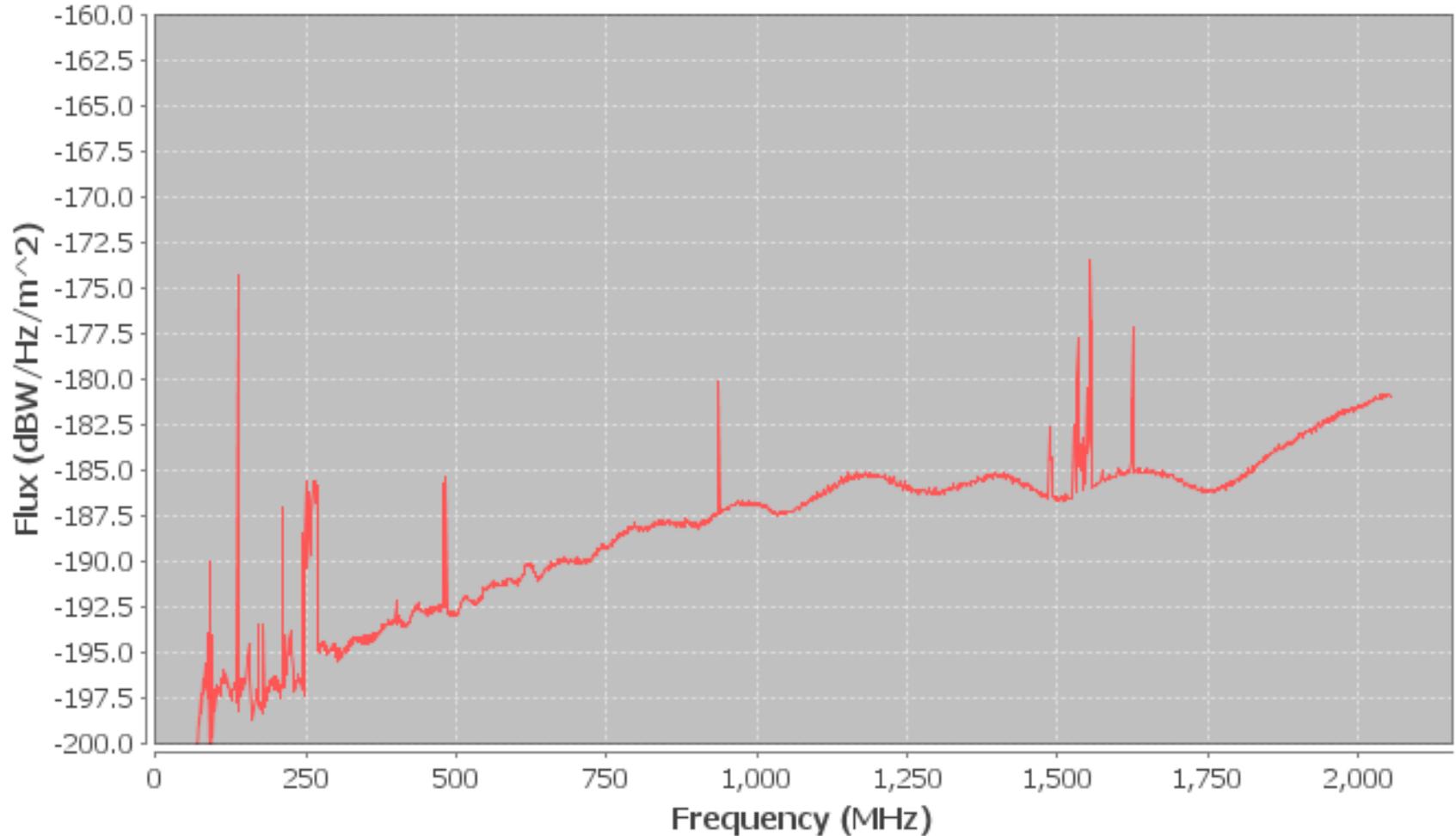
Site 5A Log Periodic North

pp5aNNNorm.dat



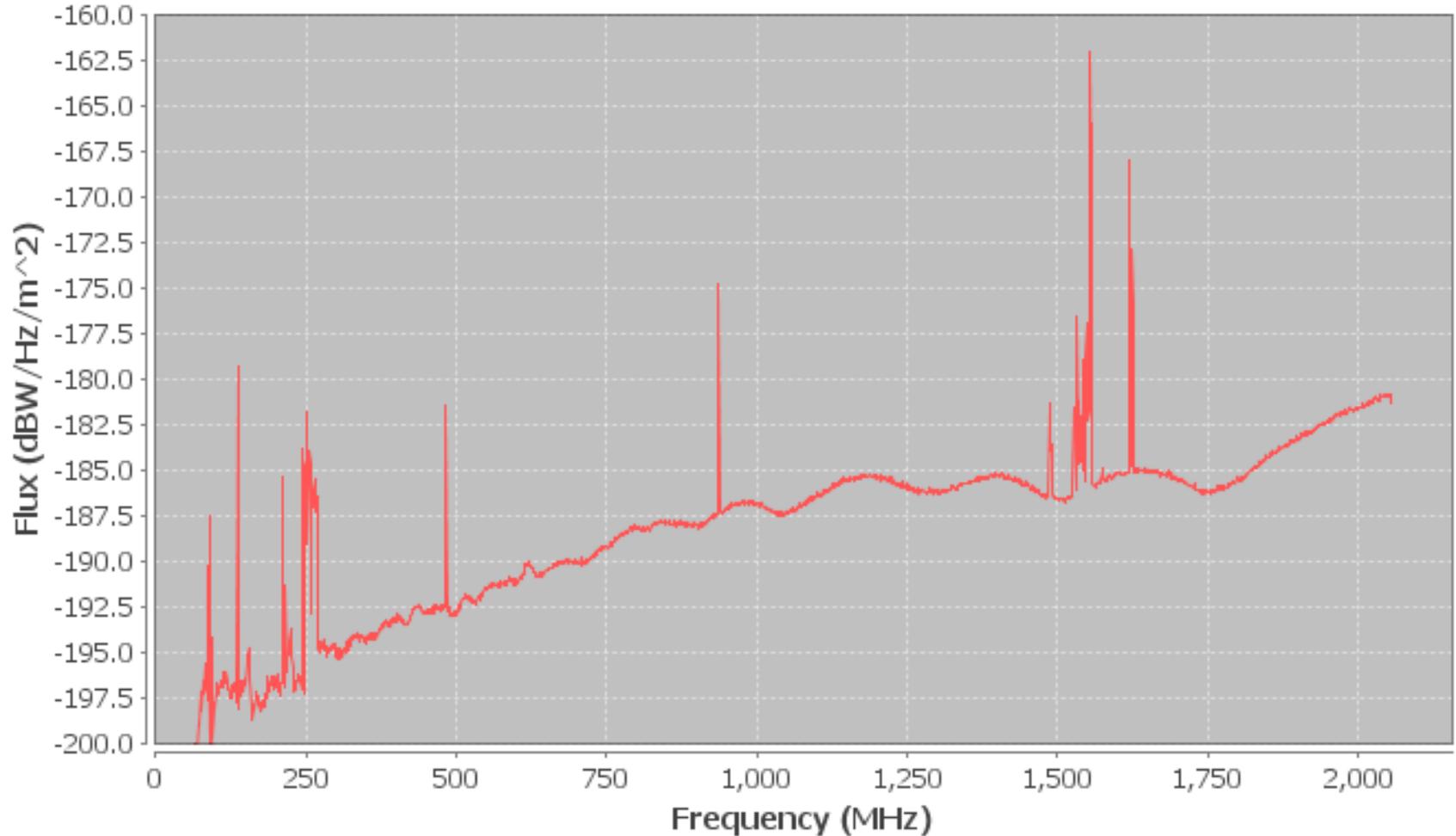
Site 5A Log Periodic North-East

pp5aNENorm.dat



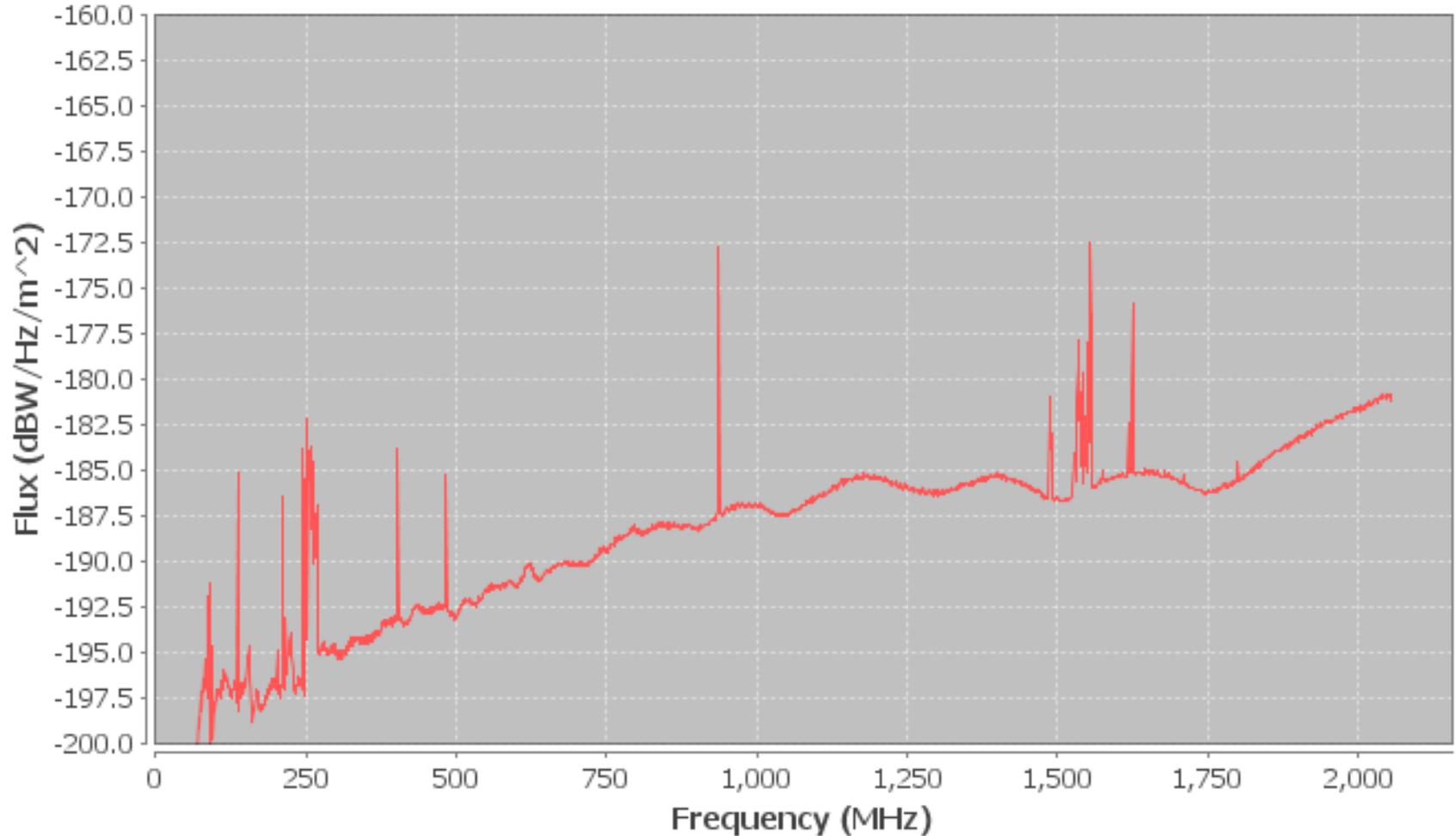
Site 5A Log Periodic East

pp5aEENorm.dat



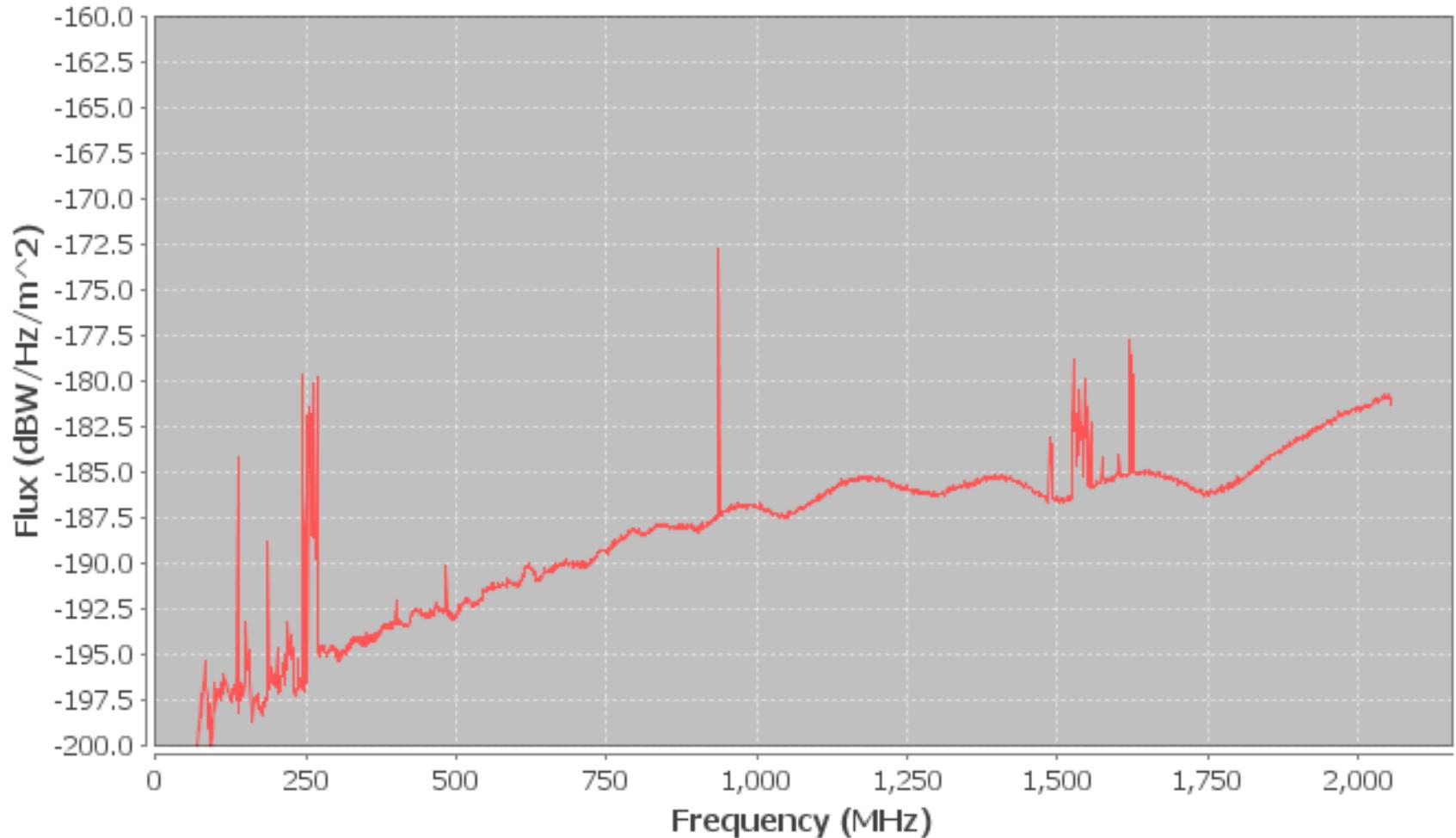
Site 5A Log Periodic South-East

pp5aSENorm.dat



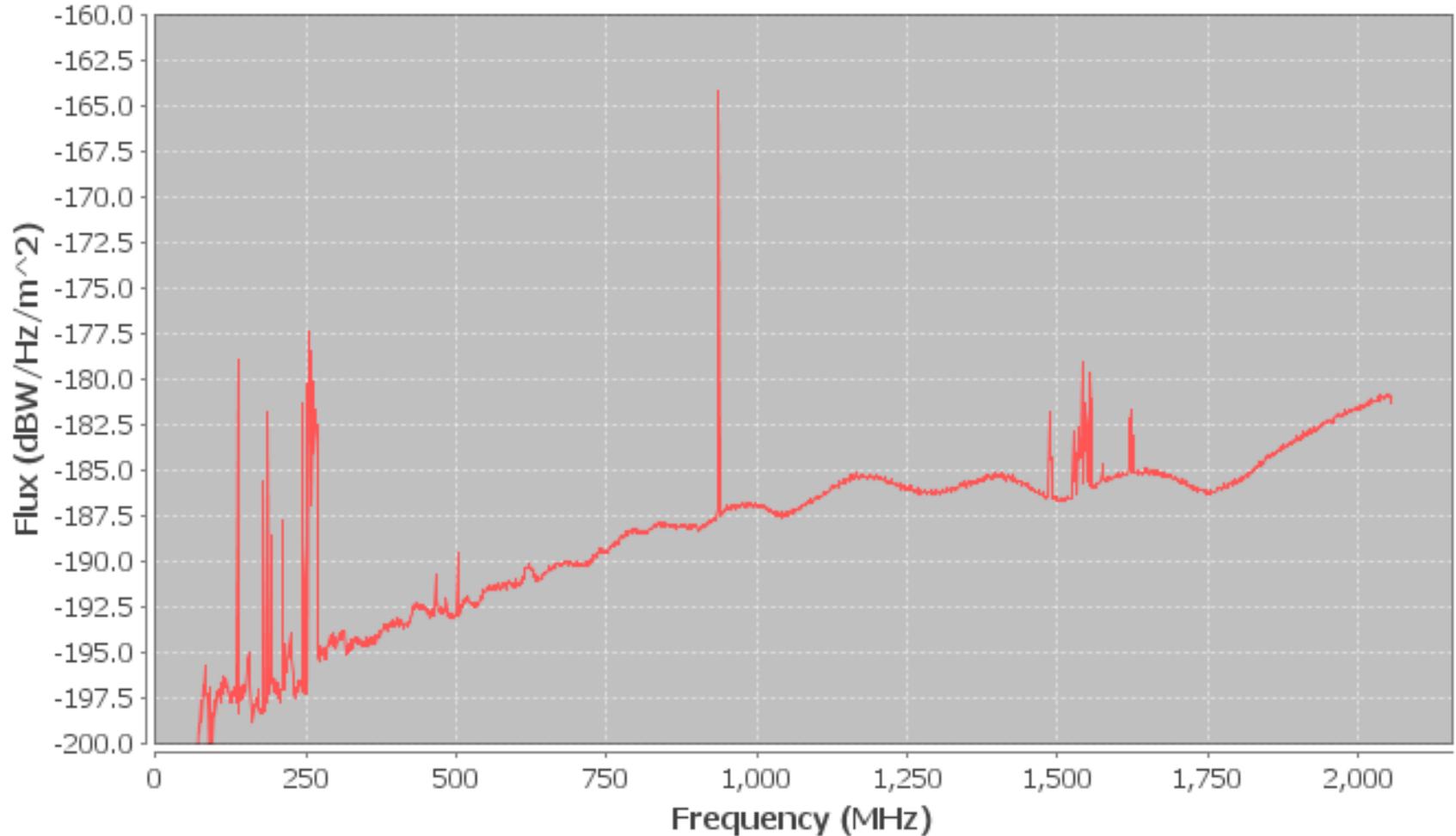
Site 5A Log Periodic South

pp5aSSNorm.dat



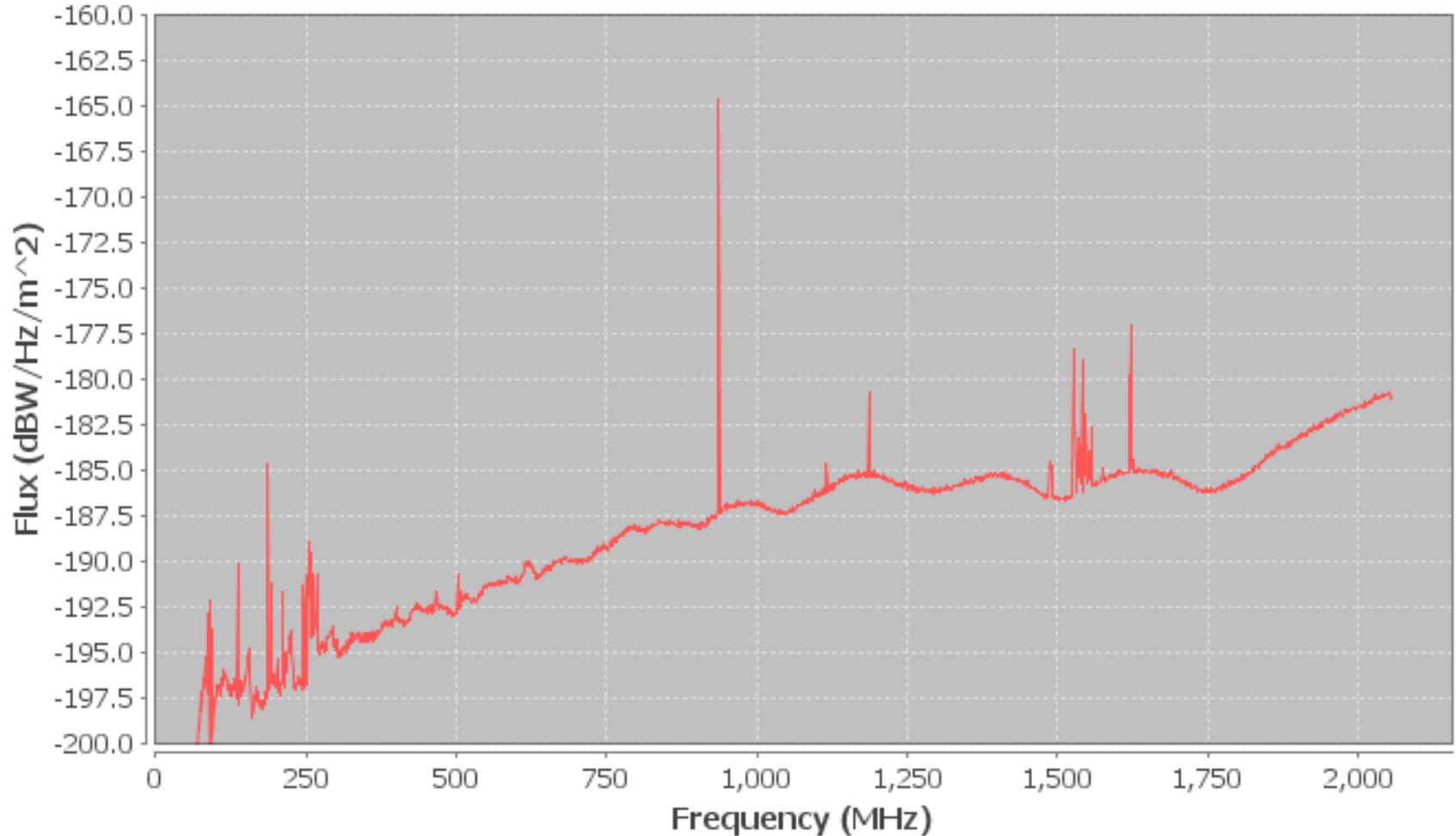
Site 5A Log Periodic South-West

pp5aSWNorm.dat



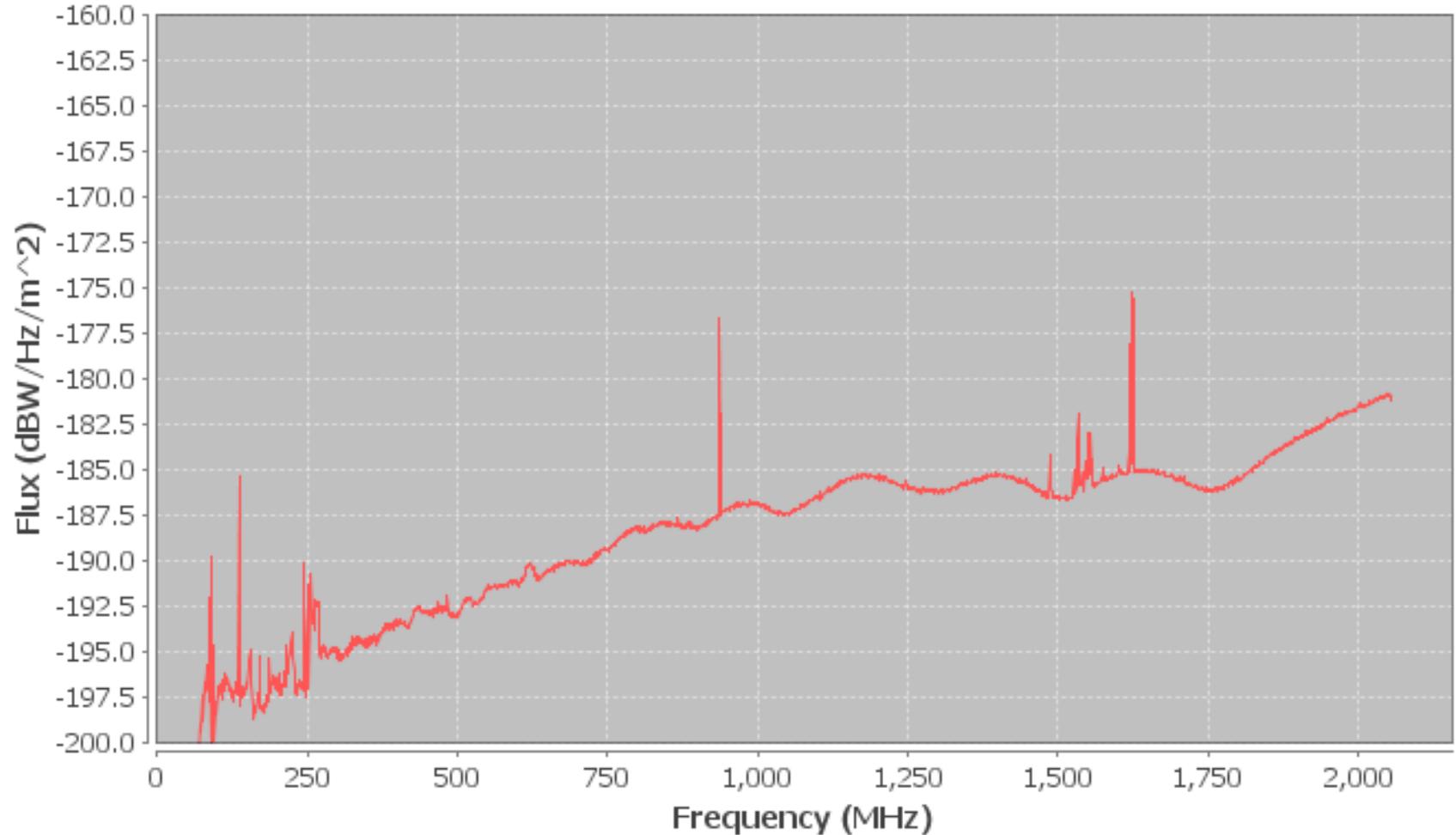
Site 5A Log Periodic West

pp5aWWNorm.dat



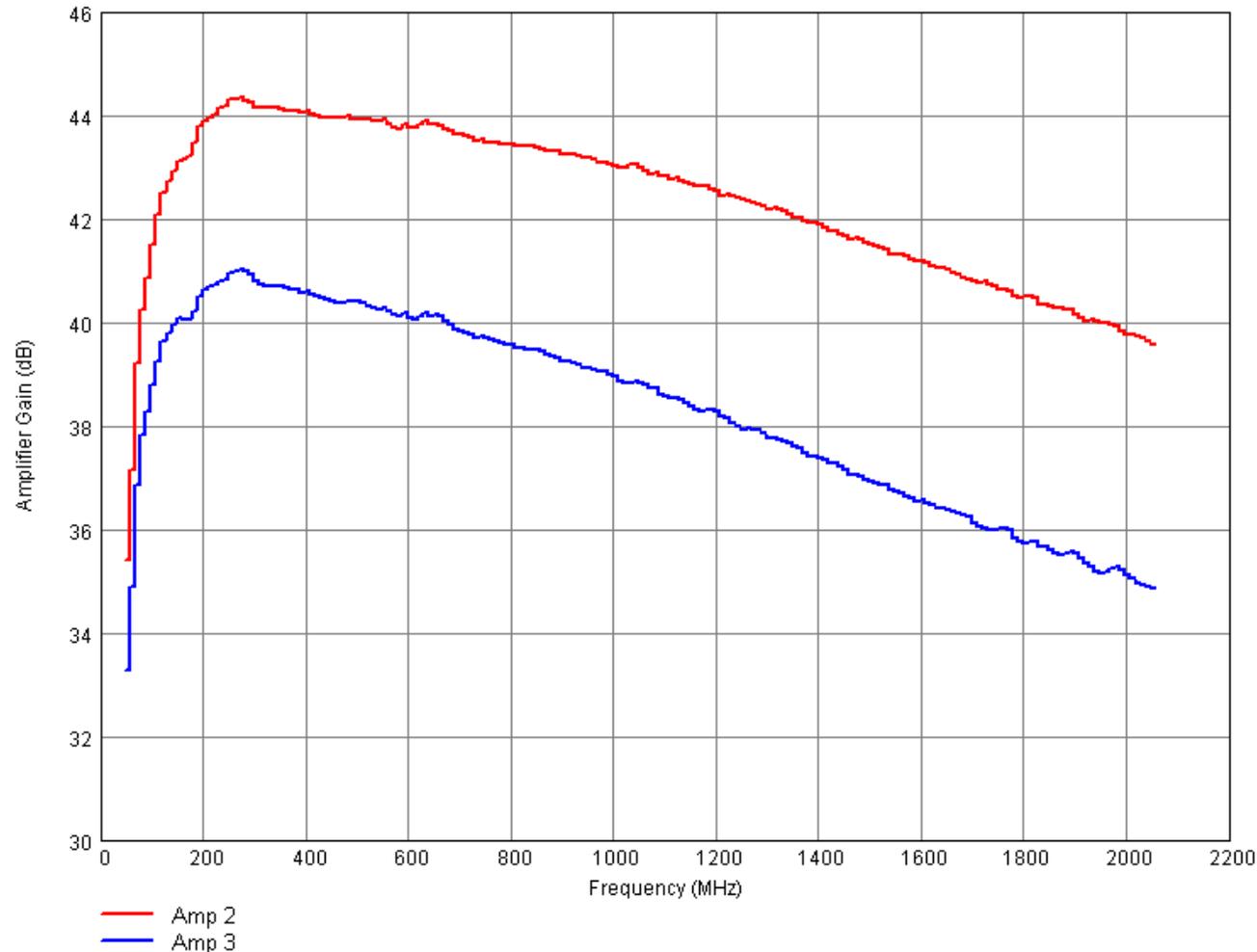
Site 5A Log Periodic North-West

pp5aNWNorm.dat



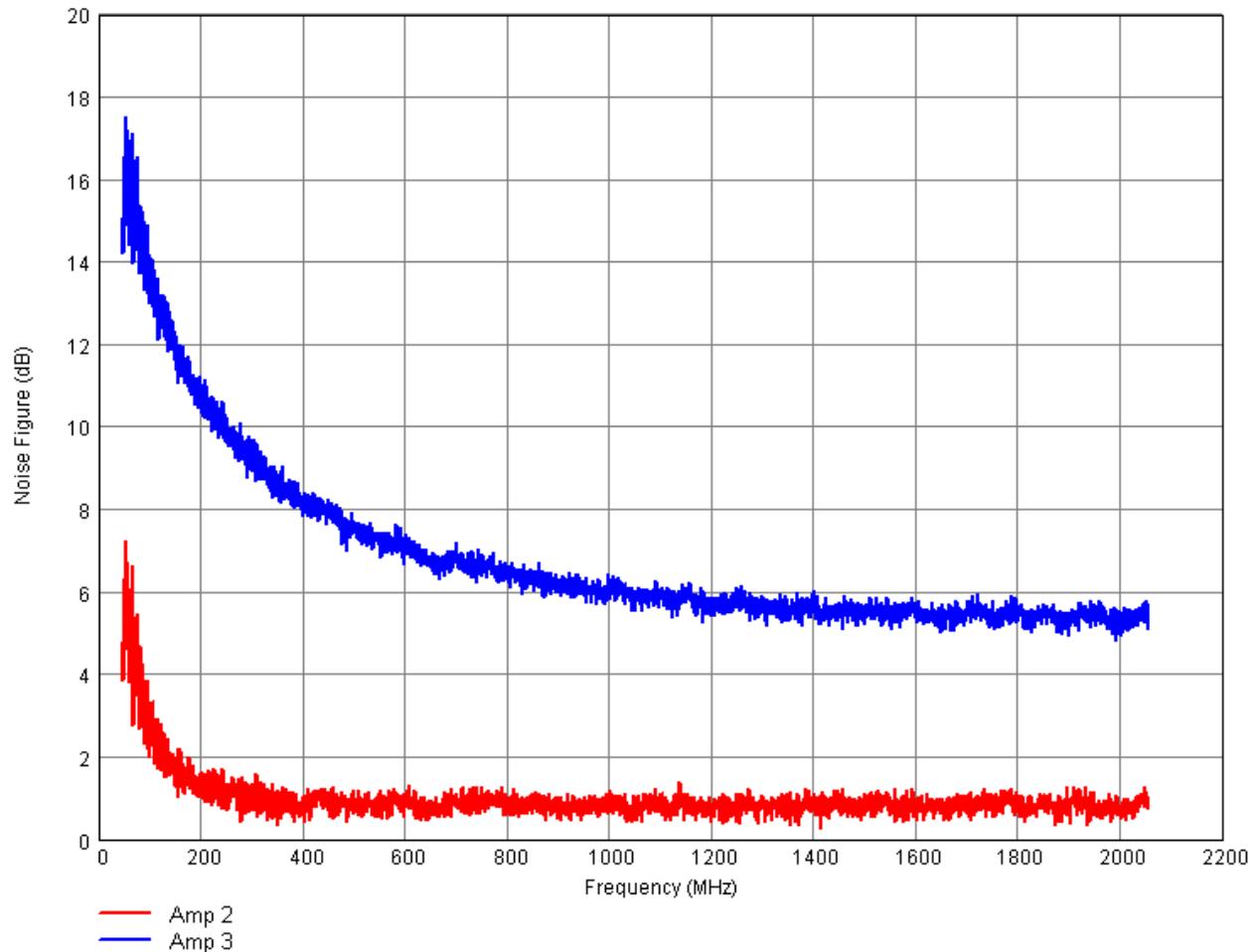
Amplifier Gain and Cable loss

- The amplifier used “lost” 5 dB of Gain during transit to Morocco
- Amp 3 was the amplifier used in Morocco.
- Amp 2 was the spare amplifier on the same plate.
- Before the trip to Morocco, both amplifiers had very similar gain. The plot is the gain after the trip to Morocco
- The measurement includes 100 ft of cable after the amplifier used during the measurements



Amplifier Noise

- The loss of gain seemed to occur on the front end of the amp so the noise figure increased significantly



Next Steps in Analysis

- Calculate integrated power of selected RFI spikes
- Plot integrated power of selected RFI spikes as a function of antenna pointing