HIBiscus and Mango-Peel antennas.

2nd Global 21cm Workshop, McGill University
October 8th, 2019

Carnegie Mellon University
CONACYT
CITA | ICAT

HIBiscus and Mango-Peel antennas, … High-Z amplifiers, and FM RFI.

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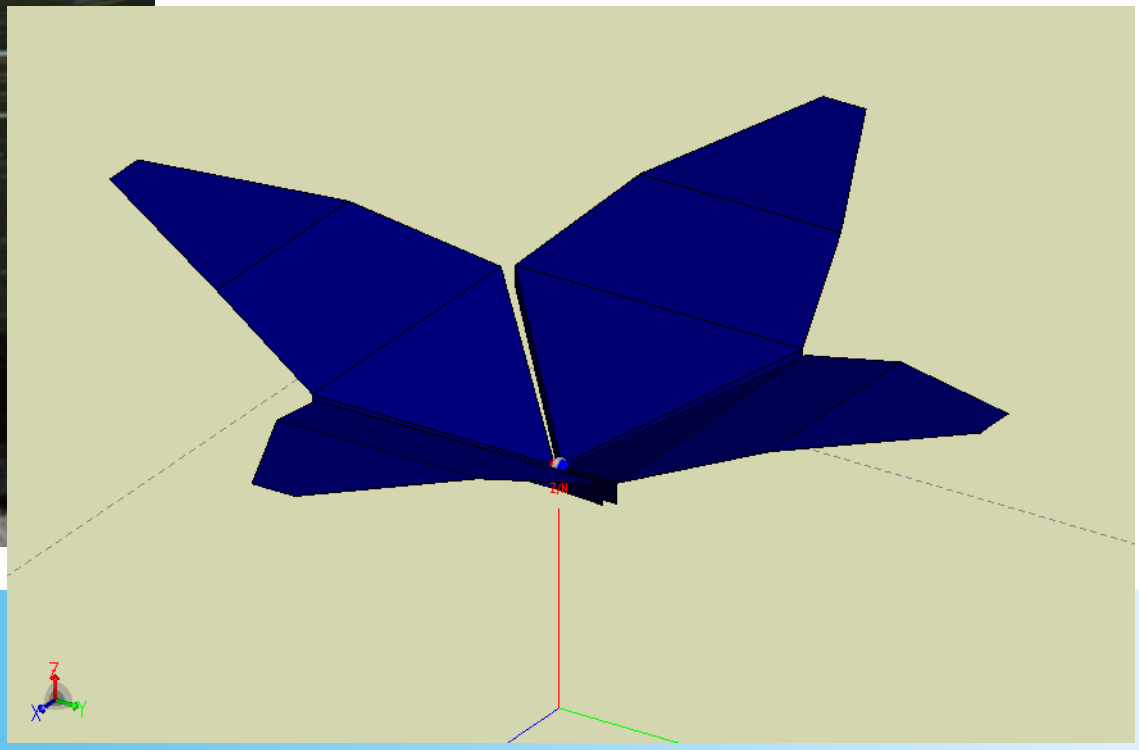
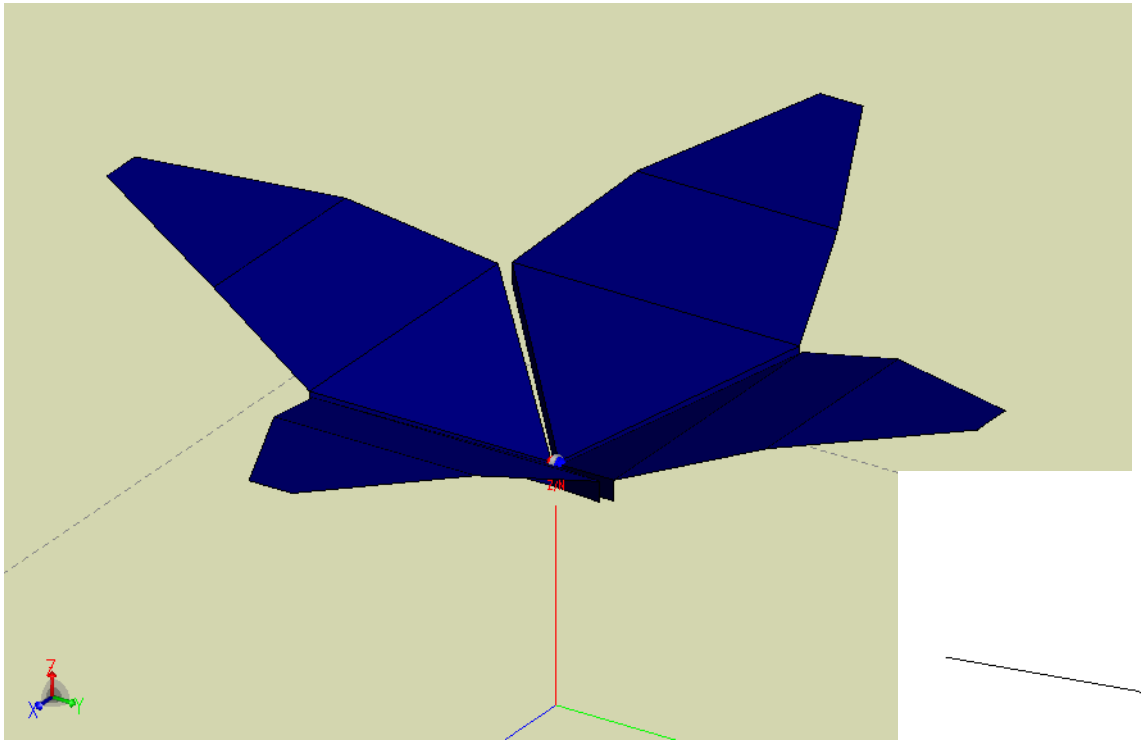
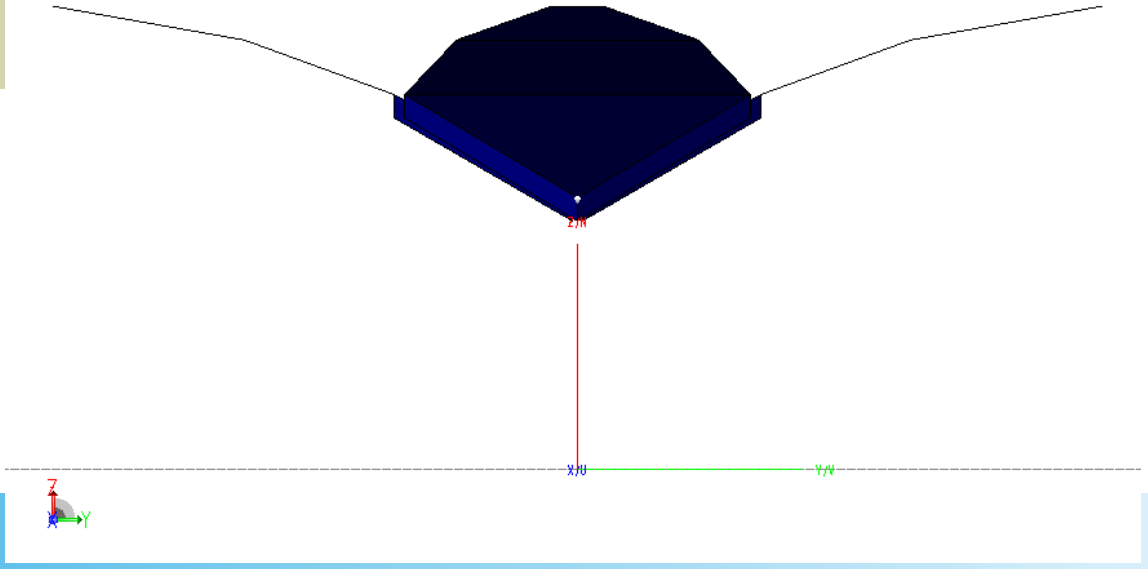
HIBiscus antenna

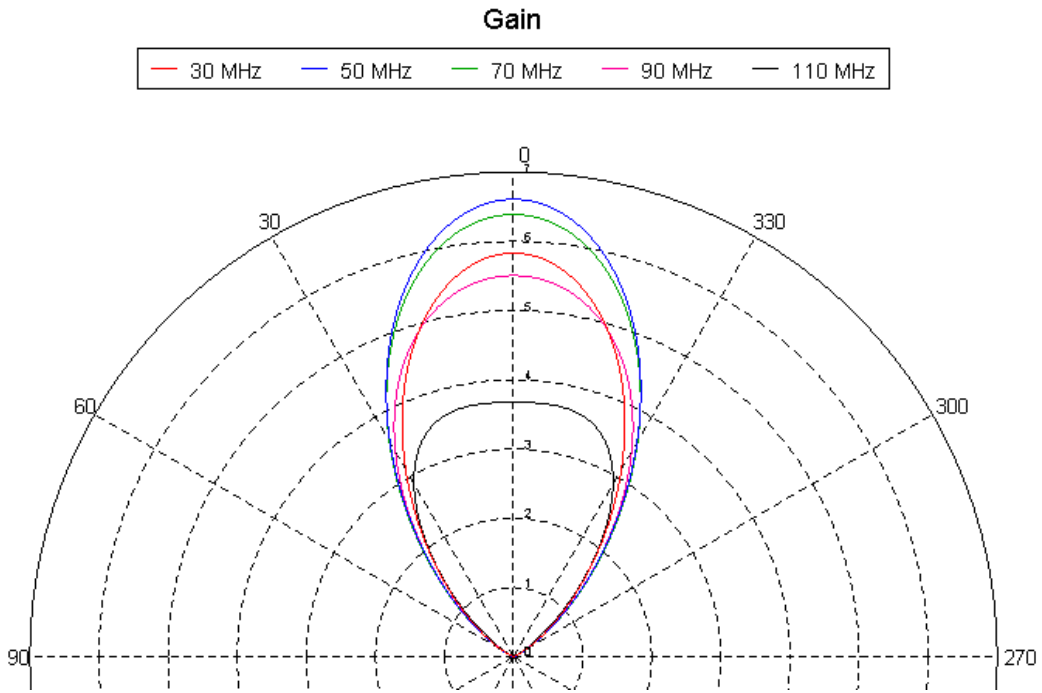


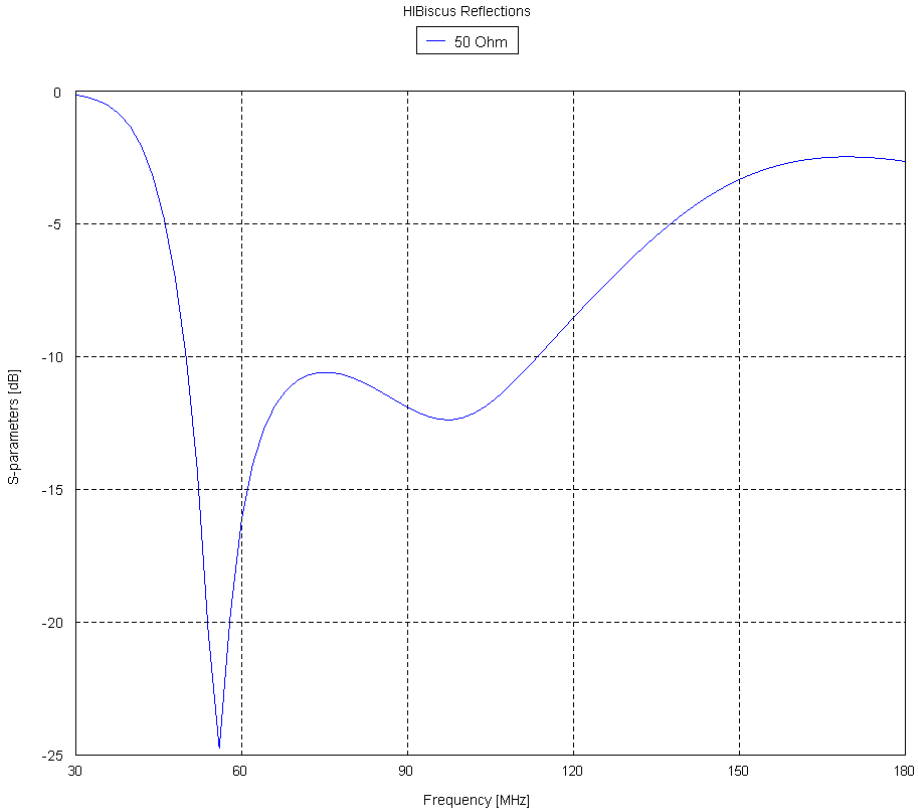
HIBiscus antenna





HIBiscus antenna

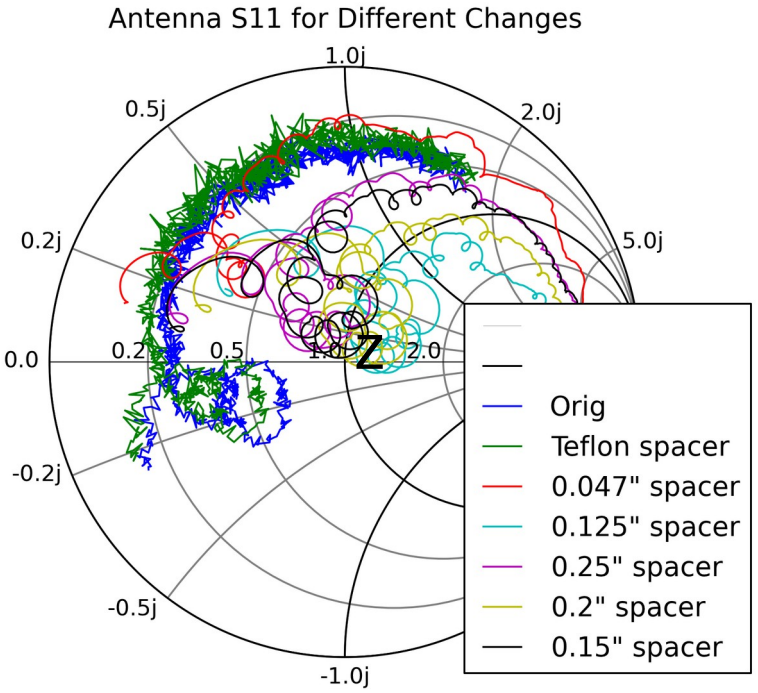


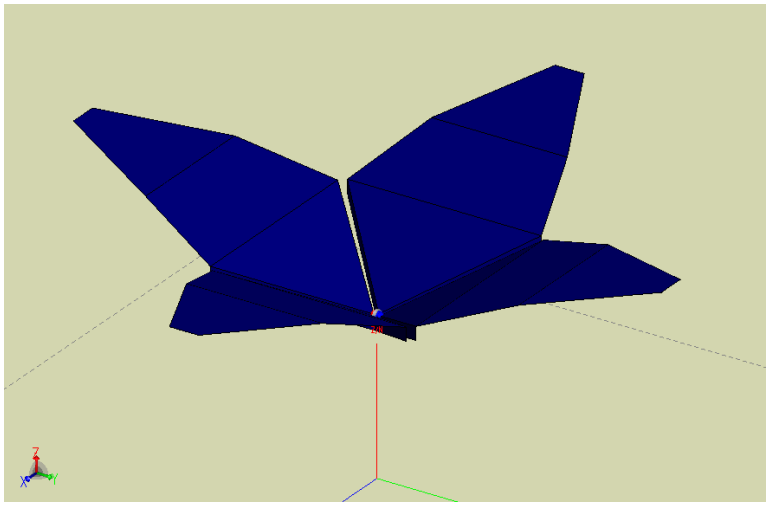


HIBiscus antenna

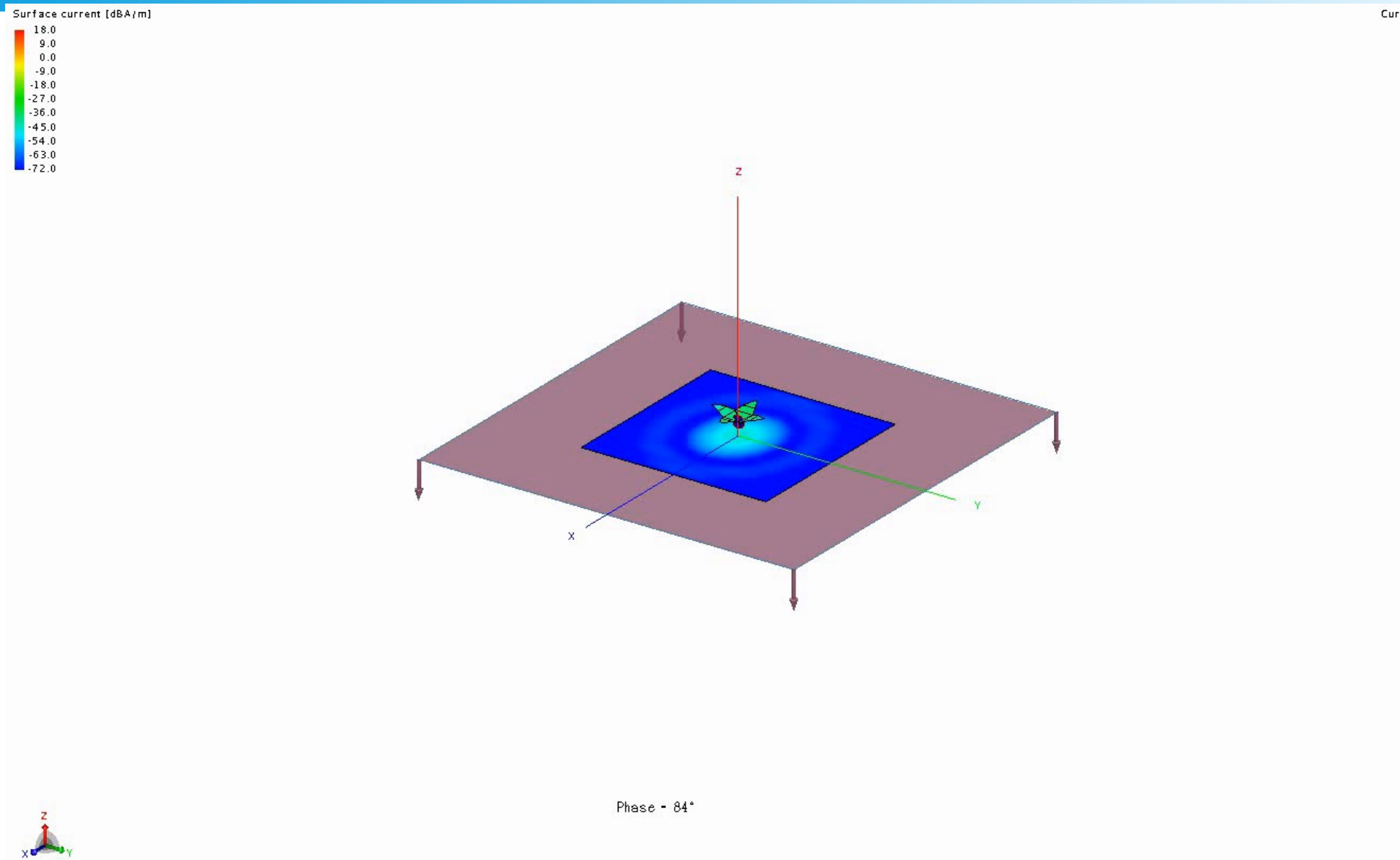
Started with 4-point antenna, EDGES antenna, and horn antenna.

Impedance – spacing of the petals.
Antenna pattern - angles of the faceted petals and height.



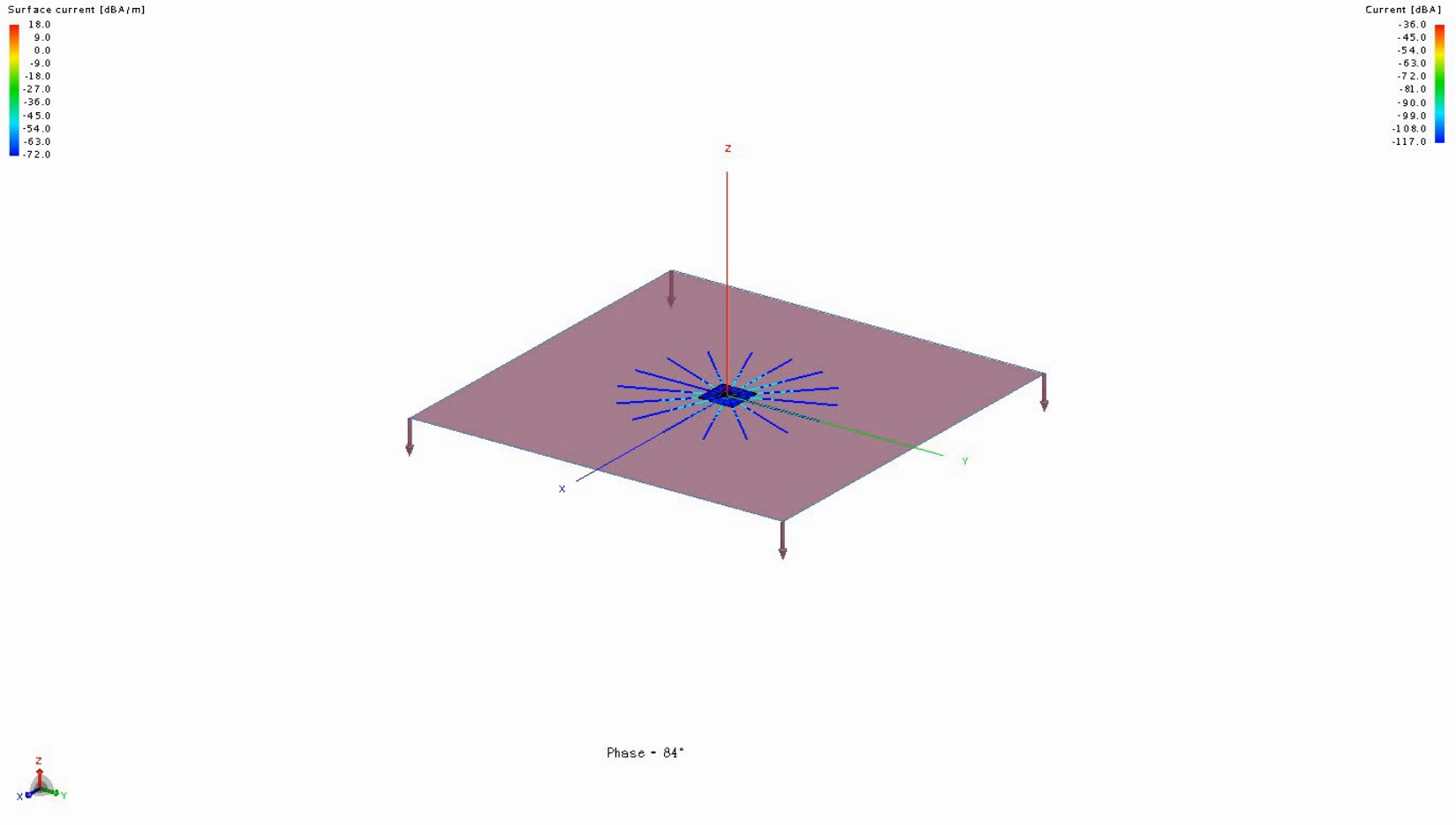


HIBiscus antenna



PRIzM 100-MHz, 7m ground plane

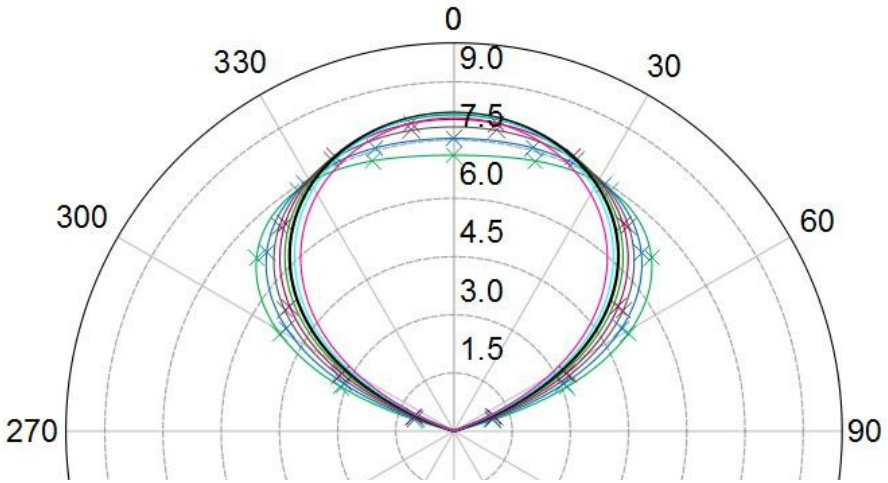
HIBiscus antenna

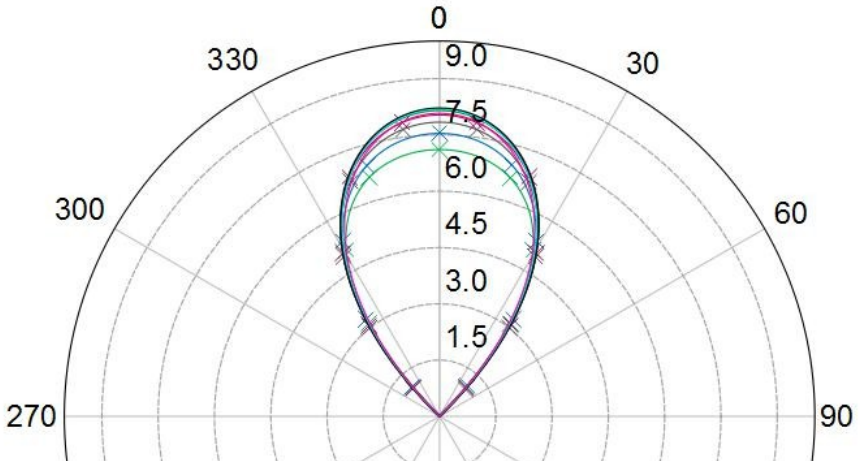


PRIzM 100-MHz
7m ground plane + radials

Mango-Peel antenna

Antenna pattern

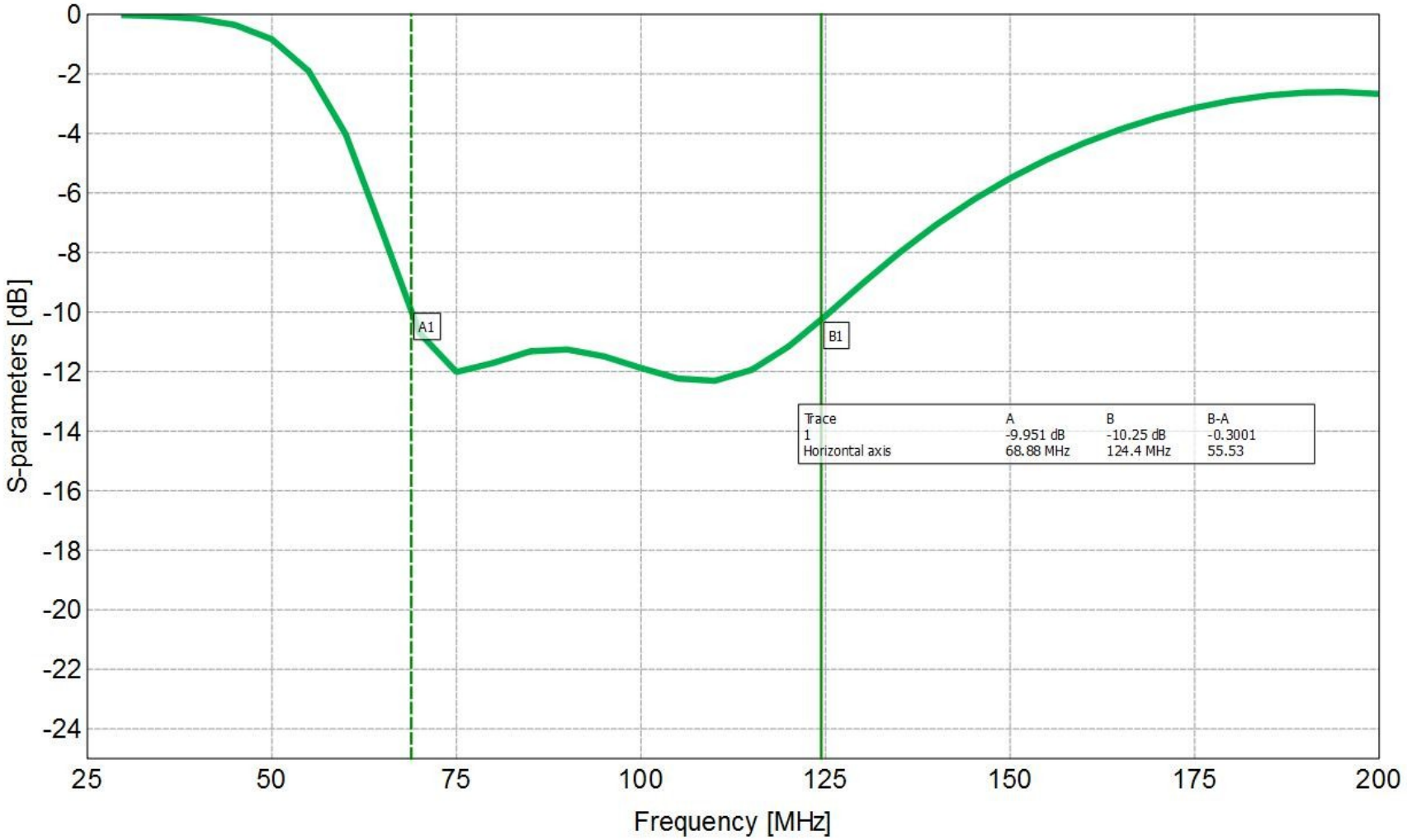




60 to 110 MHz

Mango-Peel antenna

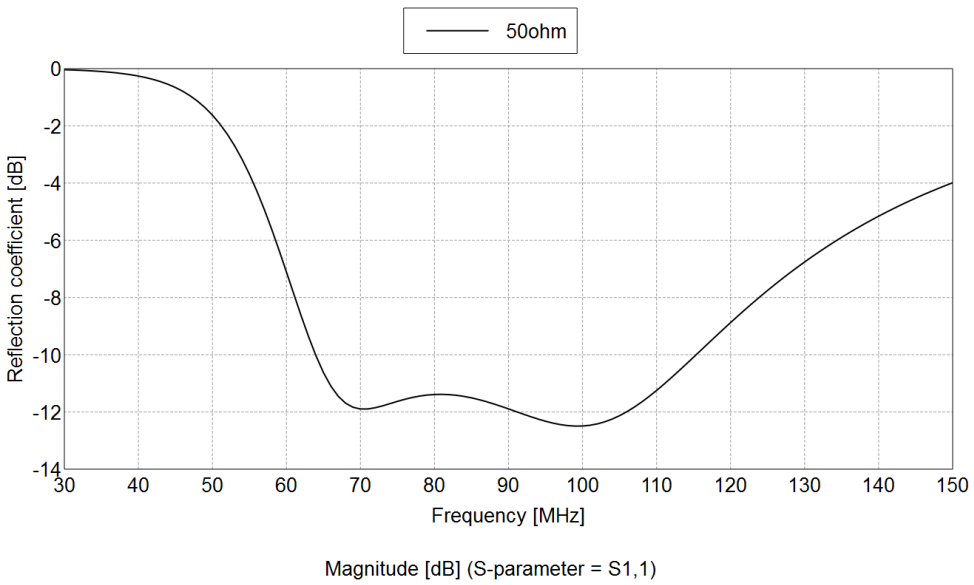
Antenna pattern



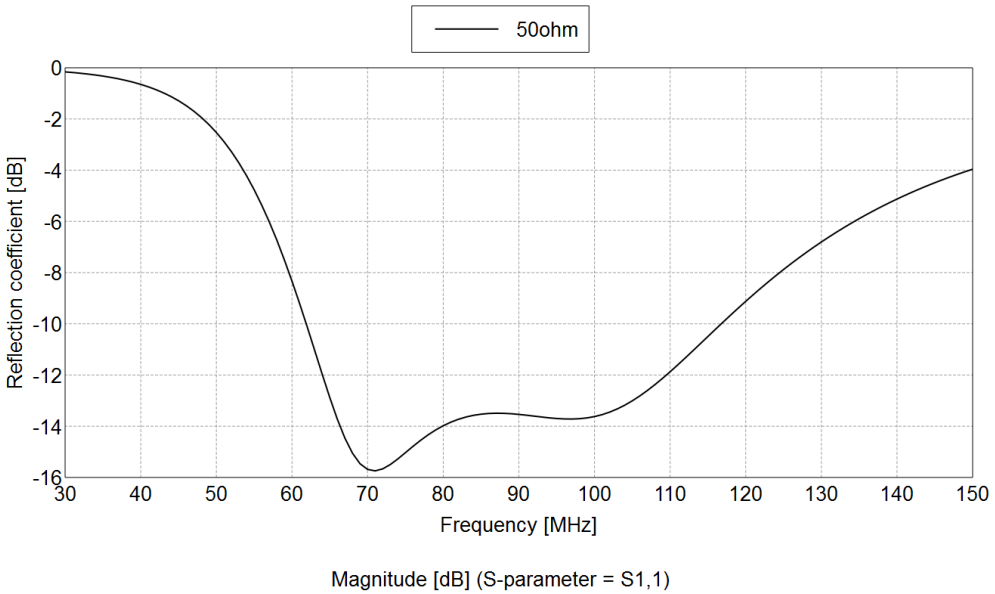
69 to 124 MHz

Mango-Peel antenna

S11 and ground plane

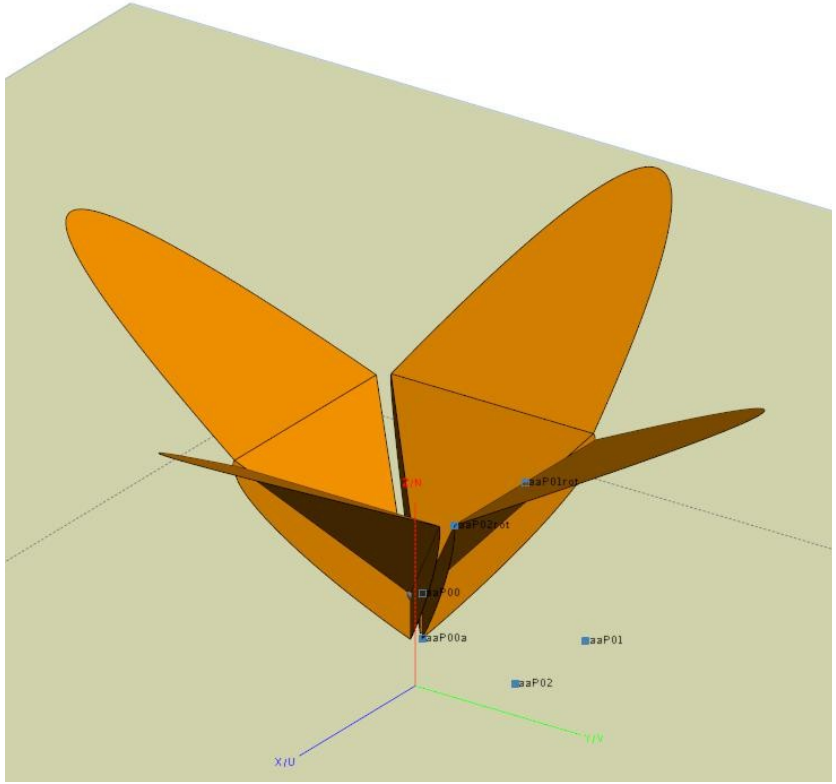


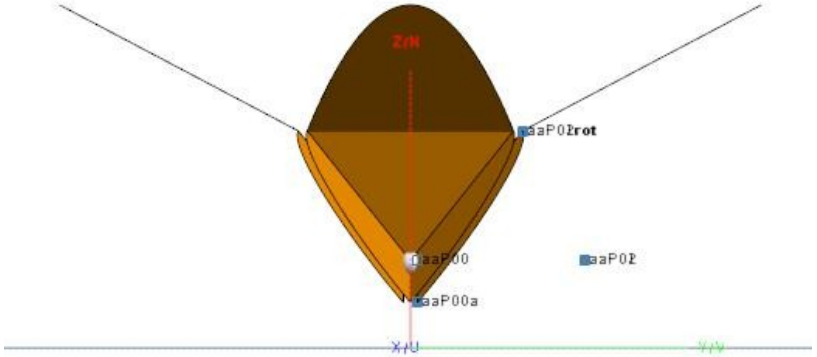
No ground plane
Dry soil



10m square ground plane
(16)20m radials
Soil: dry, rocky and marshy

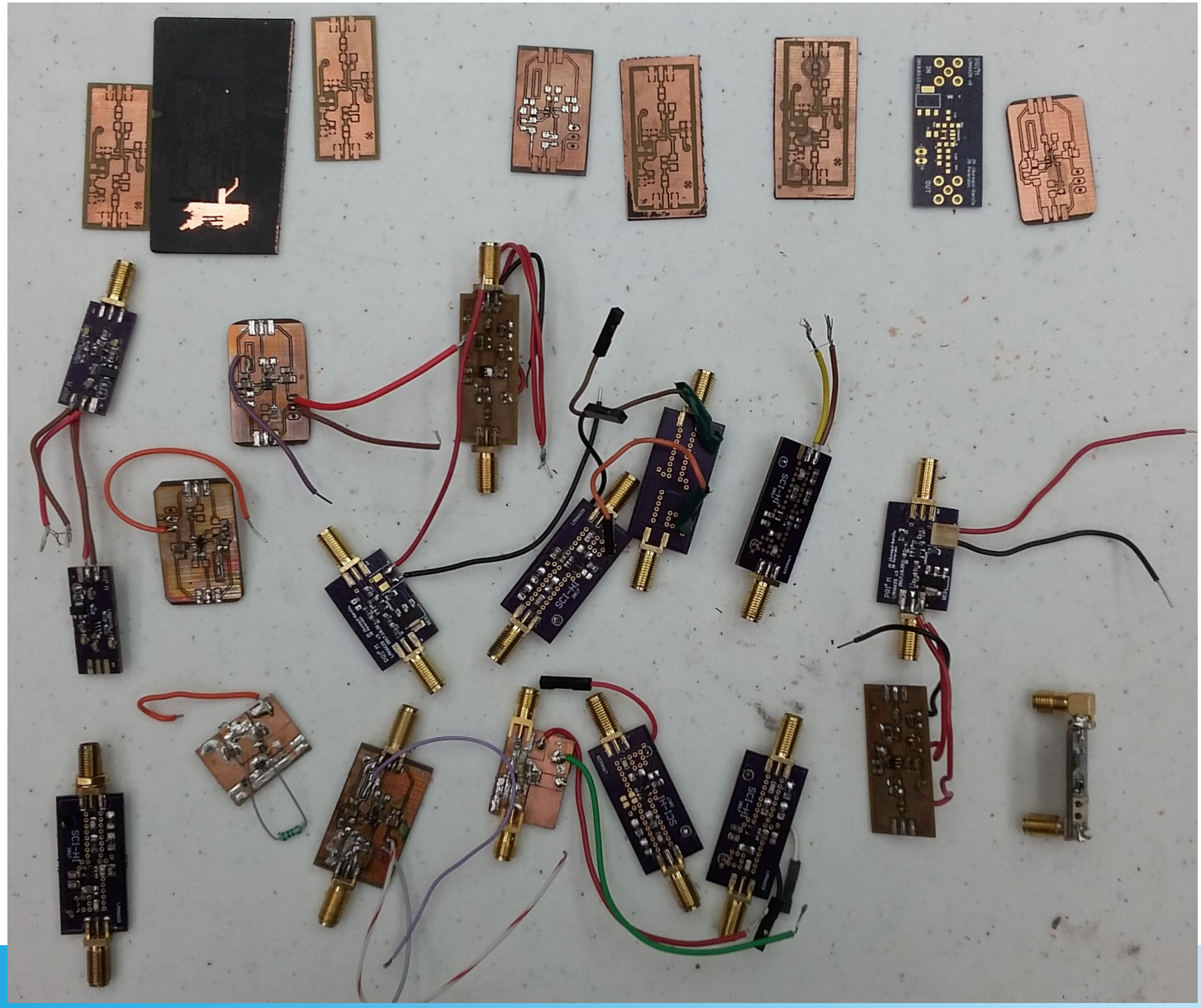
Mango-Peel antenna





Mango-Peel antenna

High-Z amplifier



High-Z amplifier

Amplifier options

Device	Company	Noise (nV/Hz)	Bandwidth (MHz)	R in	C in
LHM6629	TI	0.69	900	450 kΩ	4 pF
LMH6624	TI	0.92	95	4.6 MΩ	2 pF
OPA659	TI	8.9	350	10 GΩ	2.5 pF
OPA657	TI	4.8	275	10 GΩ	4.5 pF
LT6200-10	Linear/AD	0.95	1,600	2.1 kΩ	4.2 pF
LT6230-10	Linear/AD	1.1	1,450	7.5 kΩ	7.7 pF
ADA4817-2	AD/Linear	4	390	500 GΩ	1.3 pF

Listed under precision and/or high-speed OA, trans-impedance.

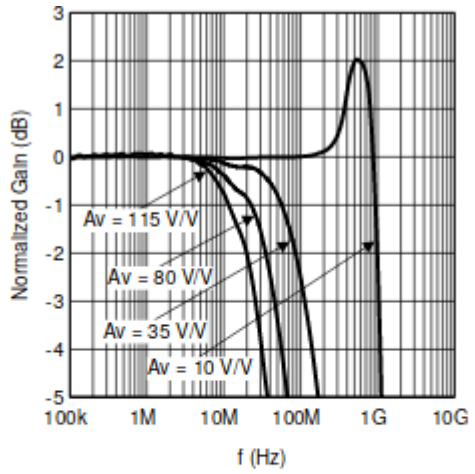
* R in & C in worst case, lowest resistance and highest capacitance.

High-Z amplifier

Package constrains

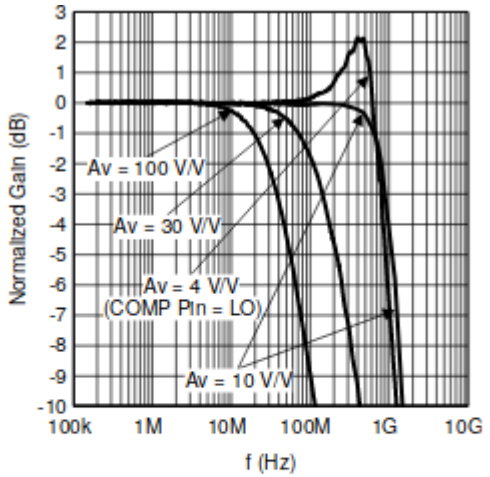
NOTE

As mentioned earlier, the SOT-23-5 package does not offer the two compensation settings that the WSON-8 offers. The SOT-23-5 is internally set for a minimum gain of 10 V/V.



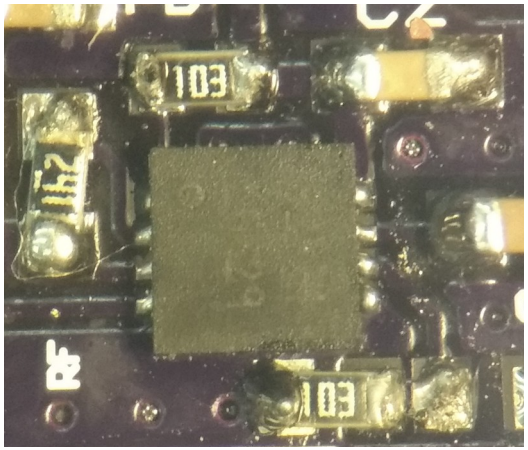
Vo = 0.2 Vpp

Figure 6. Non-Inverting Frequency Response, SOT-23-5 Package



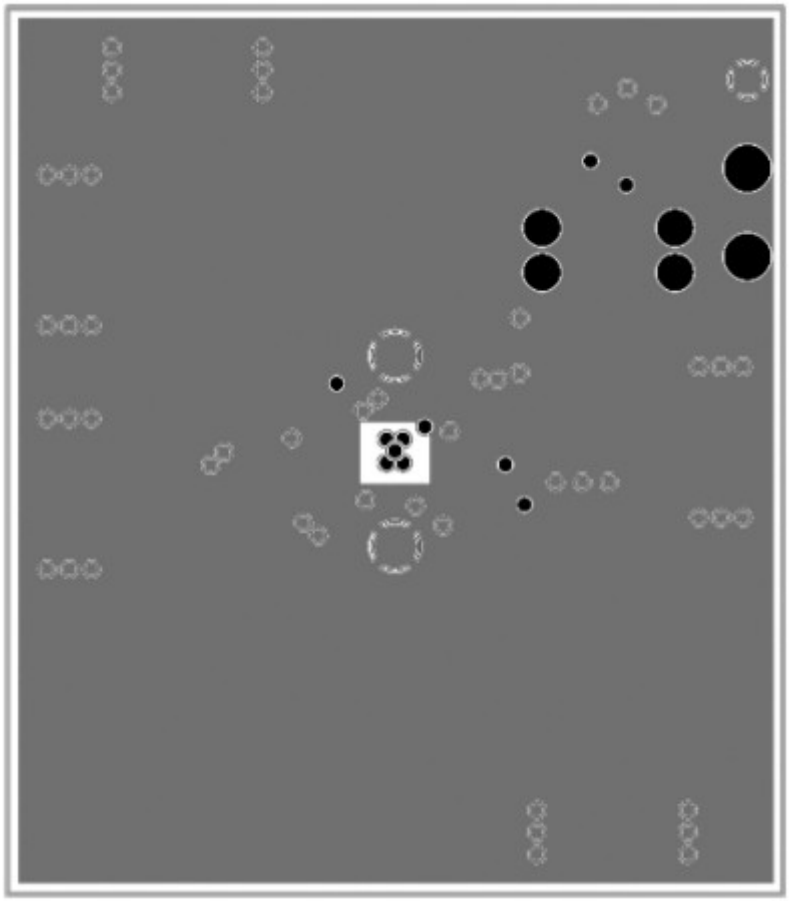
Vo = 0.2 Vpp

Figure 5. Non-Inverting Frequency Response, WSON-8 Package



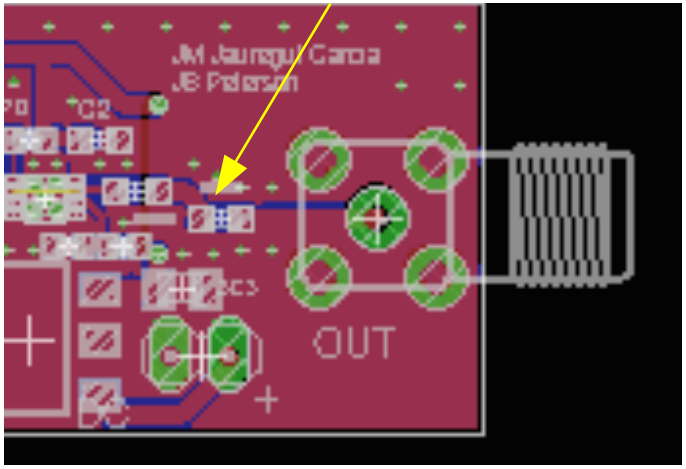
High-Z amplifier

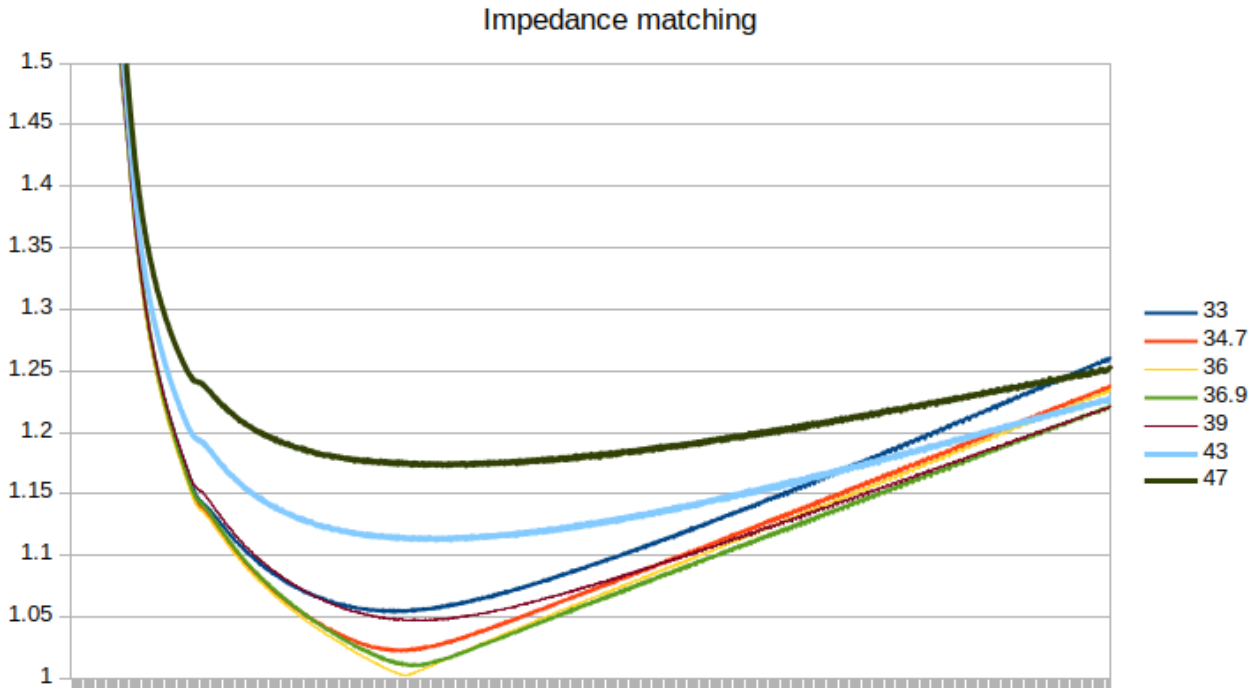
Evaluation board ground layer



High-Z amplifier

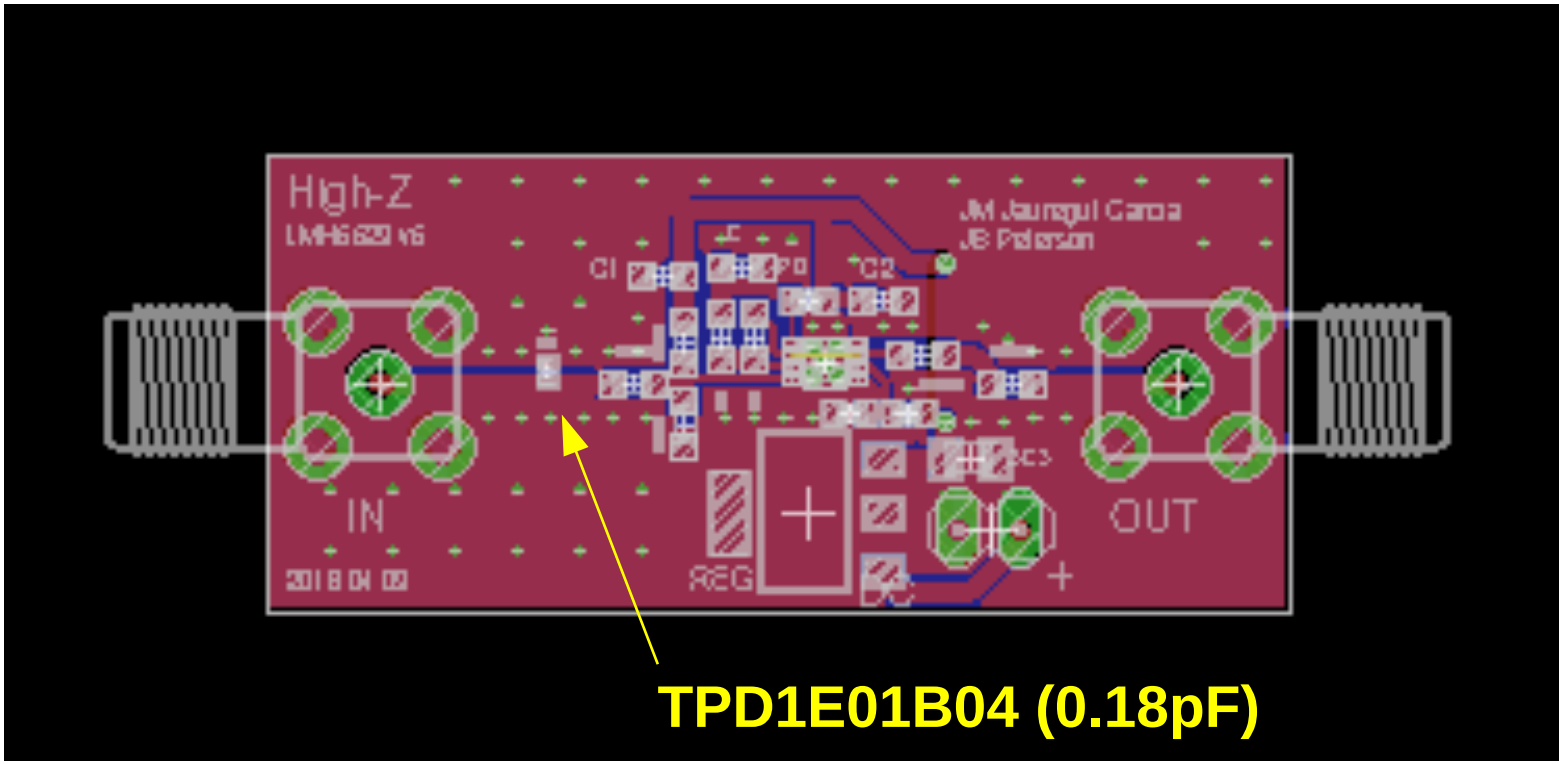
Impedance matching





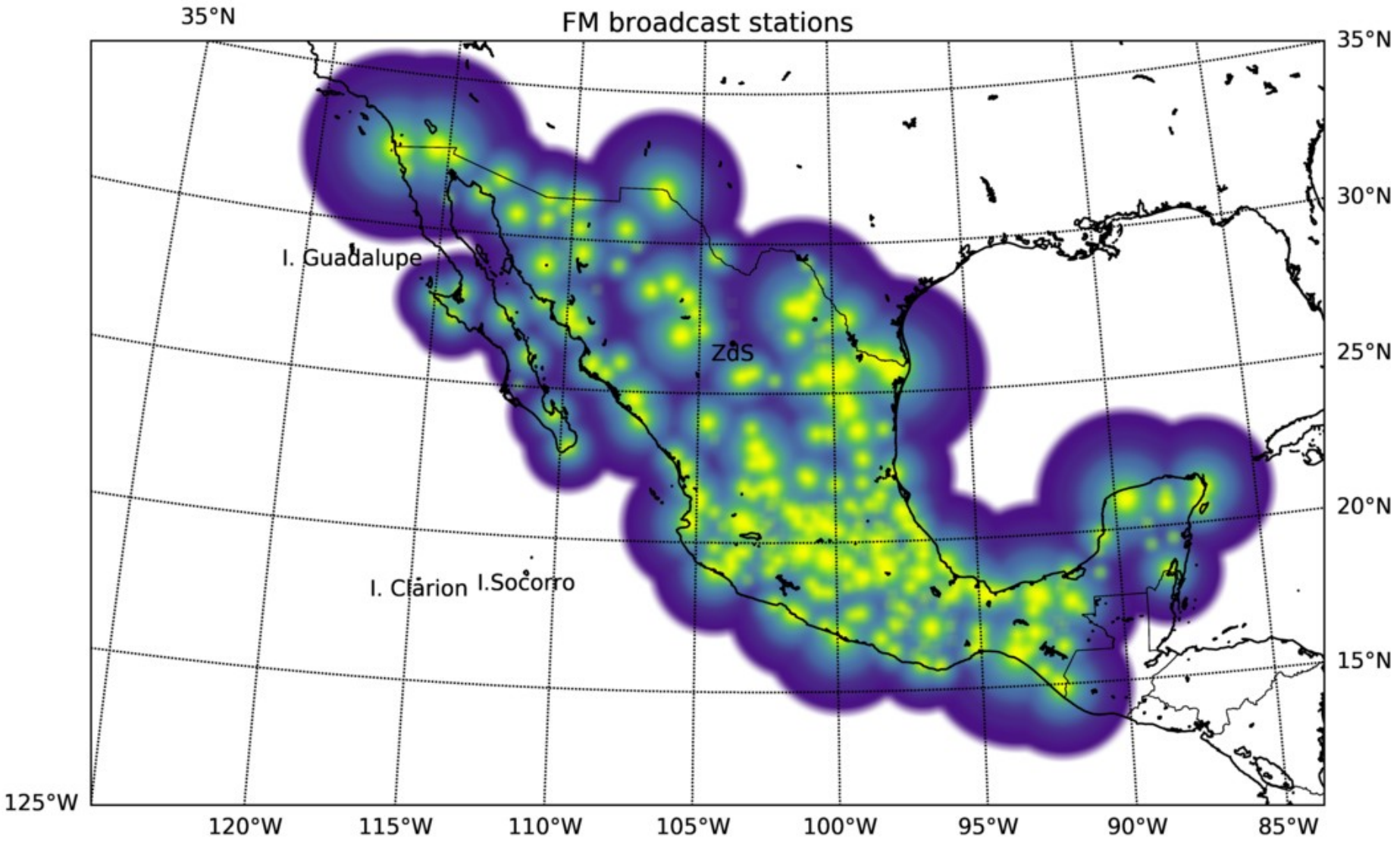
High-Z amplifier

ESD protection



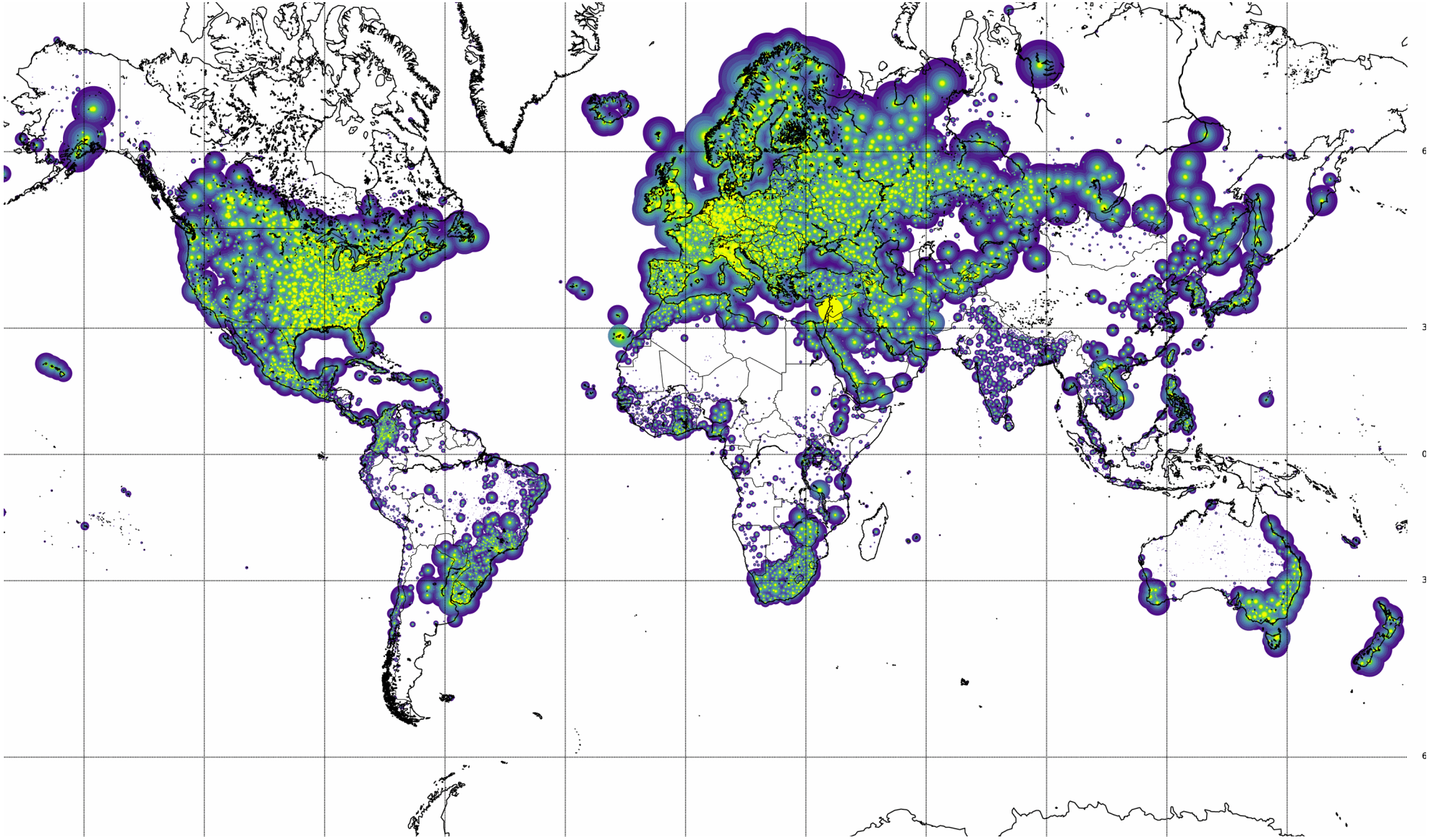
2-layer are enough for small PCBs.

RFI



INEGI and IFT

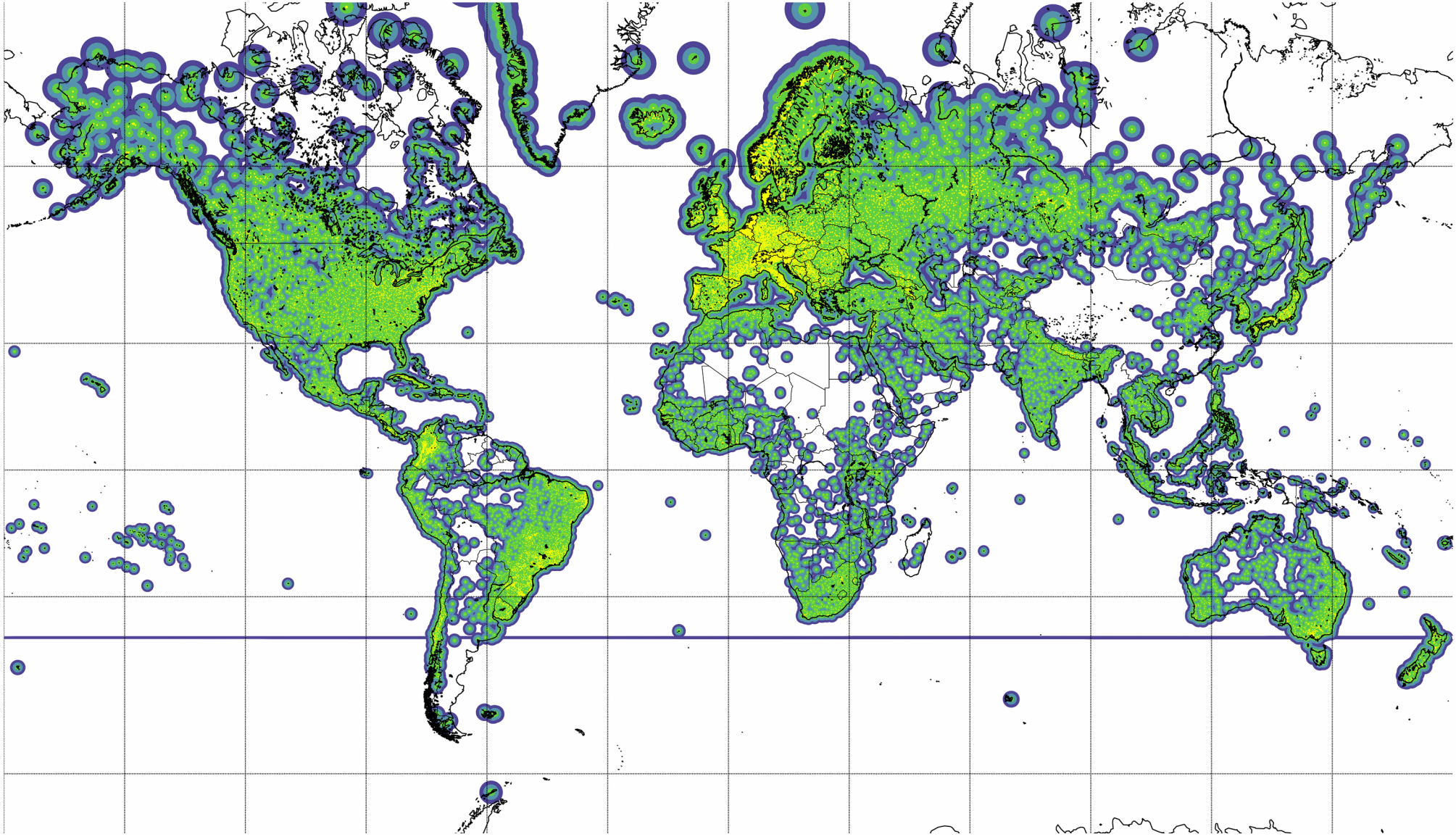
RFI



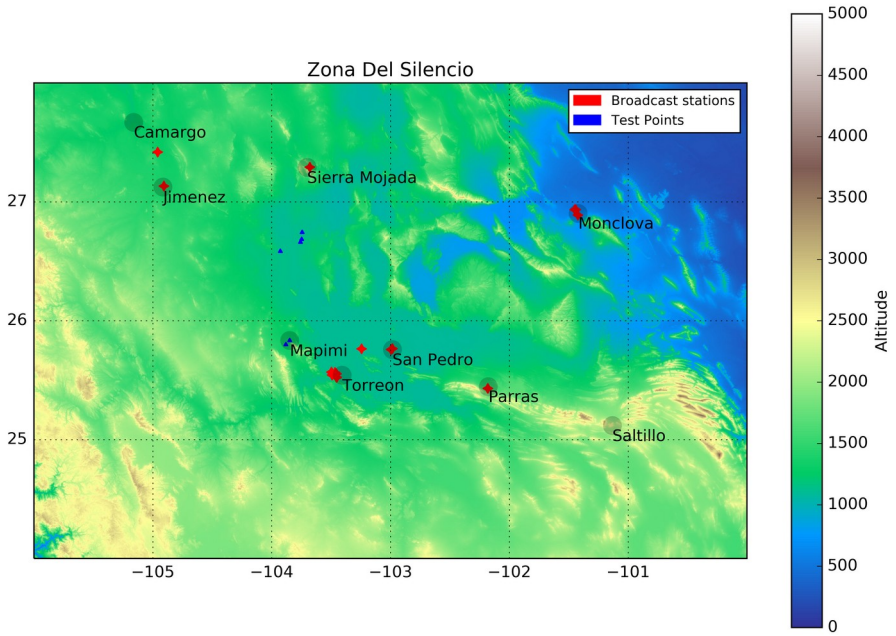
fmlist.org, spiders now allowed...

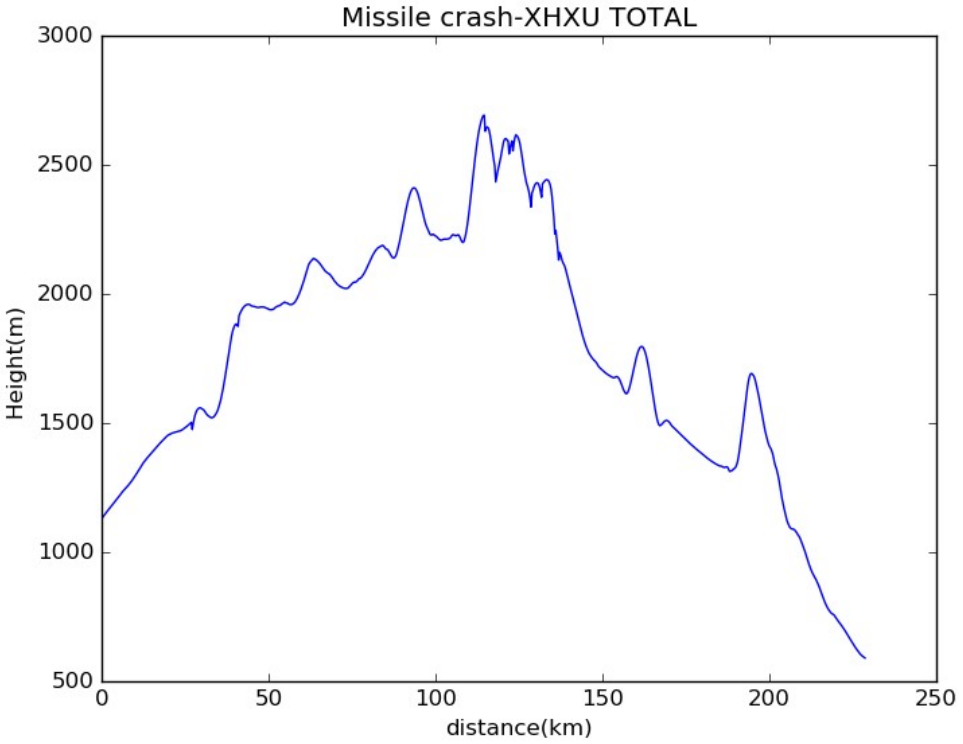
RFI

FM broadcast stations



SRTMv3 + IFT data





RFI

Radio Mobile
http://www.ve2dbe.com/