Horn Antenna

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APPLICATION

PRINCIPLES

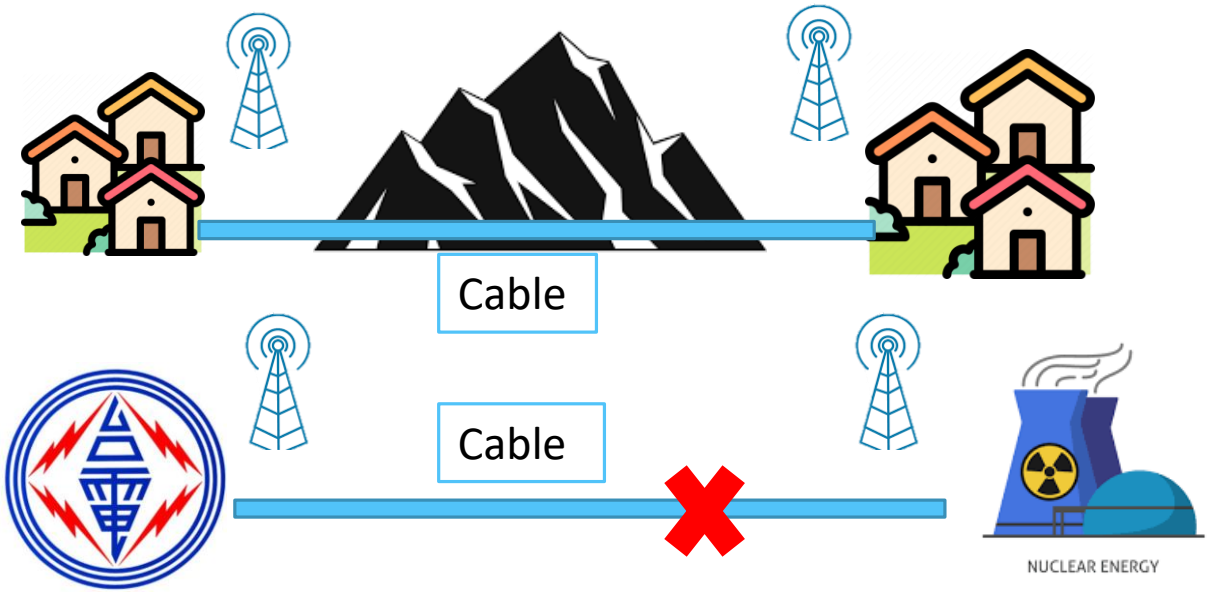
RESULTS

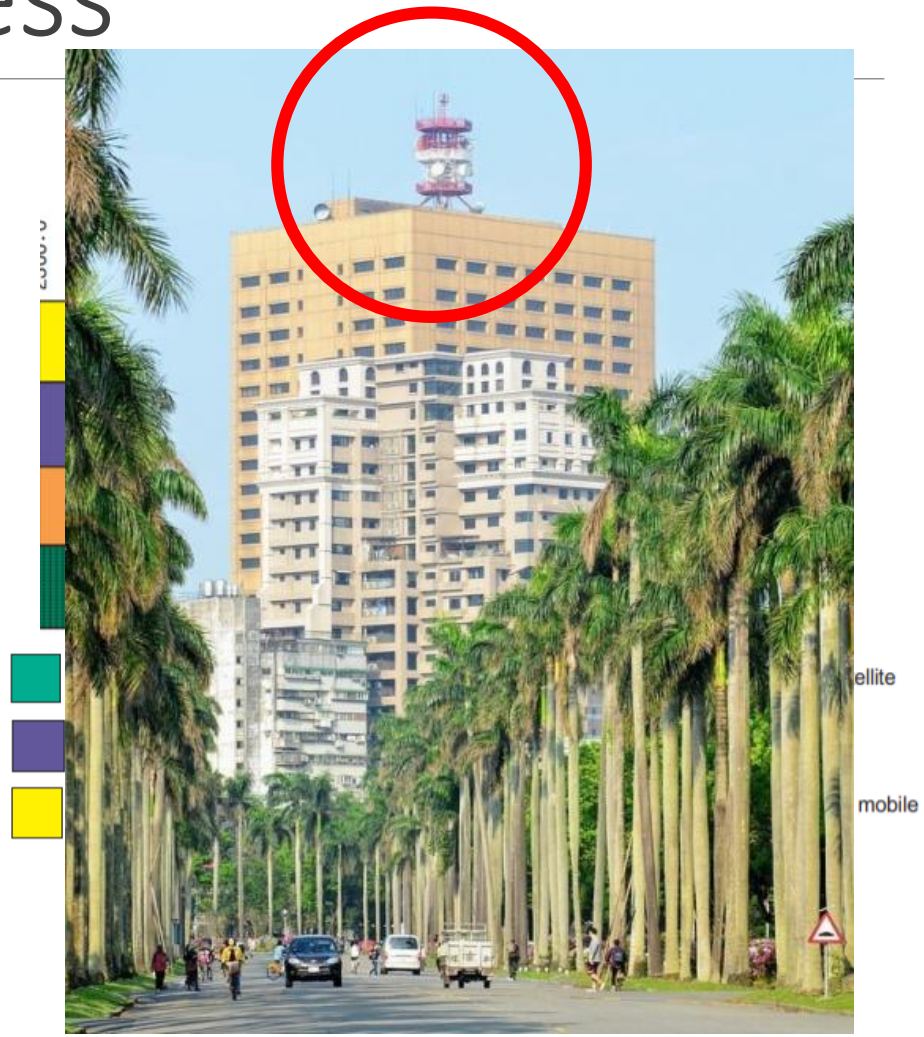
CONCLUSION

Motivation: Fixed Wireless

Wireless Communication Between Fixed Points

- **Remote Area**
- **Critical Infrastructures**





Horn

1. Narrow Beam Width
2. High Gain
3. Wide Band
4. Linear Polarized
5. Clumsy

Easy

Hard

Fixed Wireless

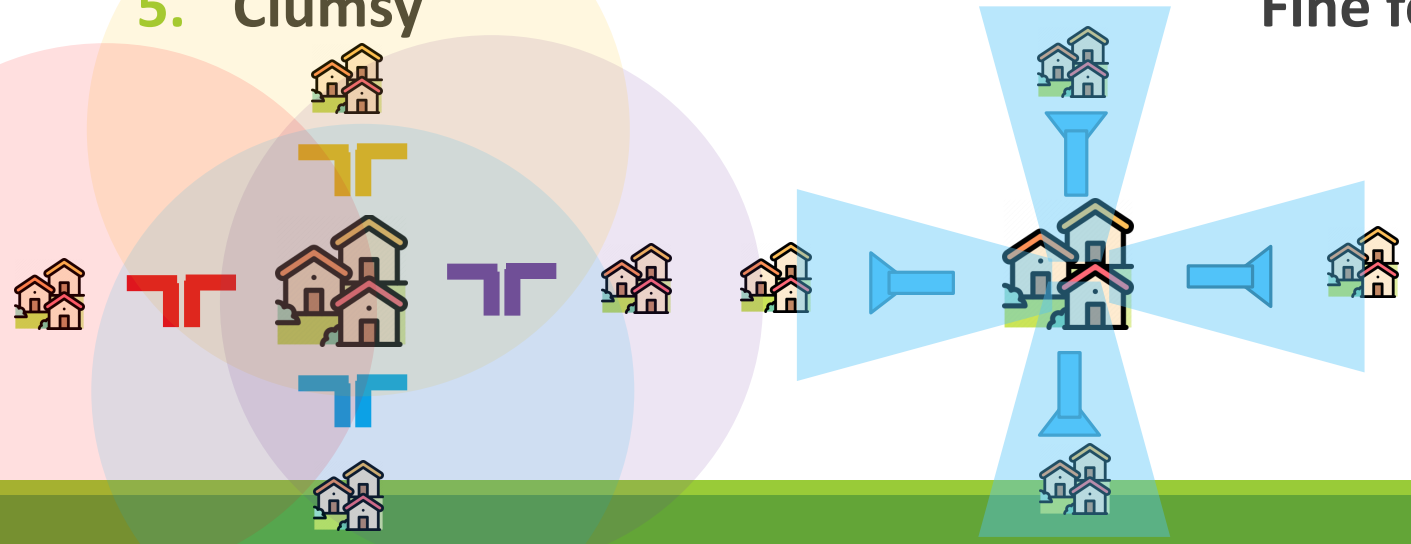
Frequency Reuse

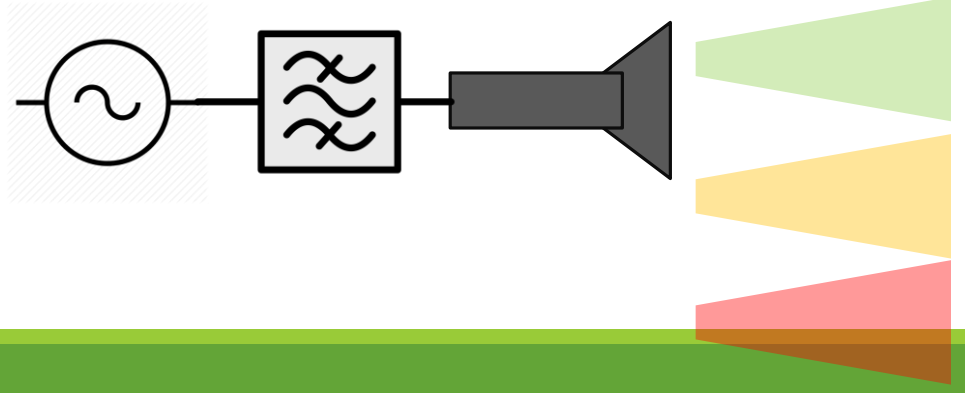
Save power and # of Stations

Allow Switching band & High data Rate

Polarization of stations are known

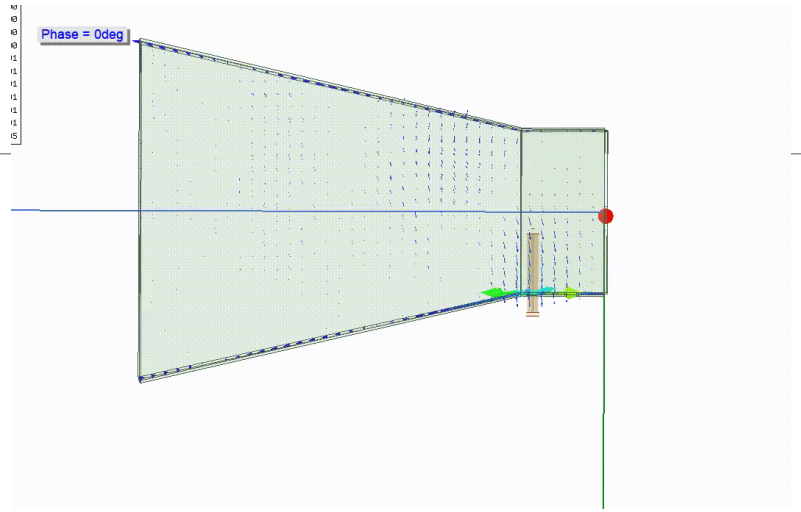
Fine for Stations

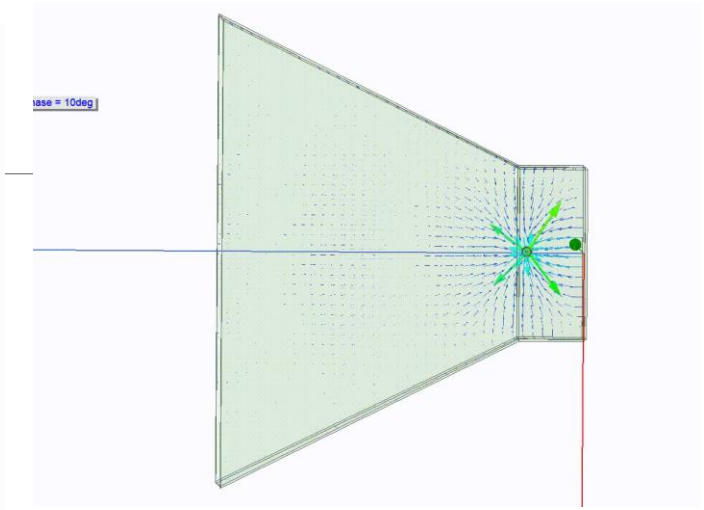


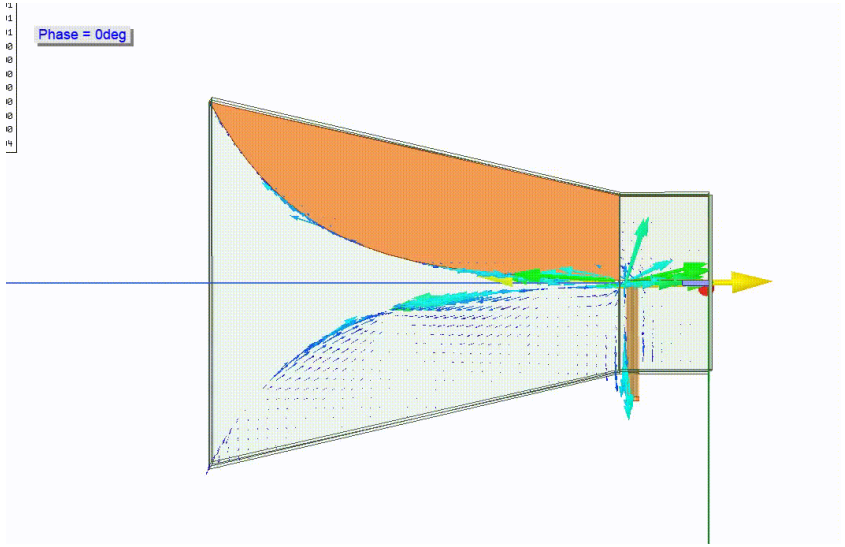


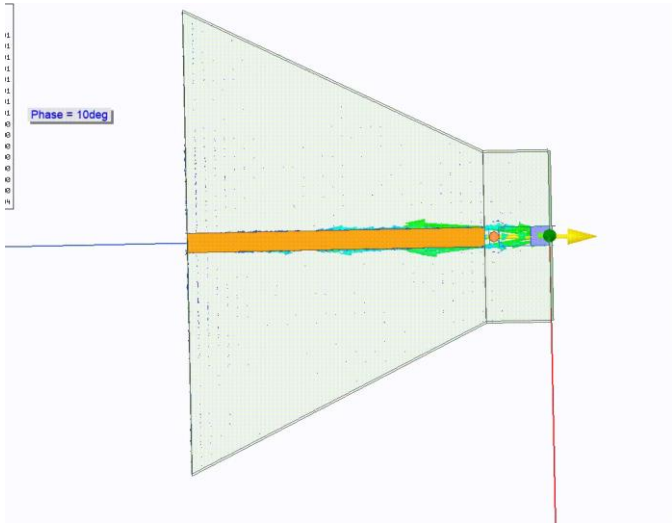
Operational Principles

1. SMA Feed in (Linearly Polarized)
2. Ridge Taper 50 Ohm to 377 Ohm
3. EM wave radiated through the Ridge









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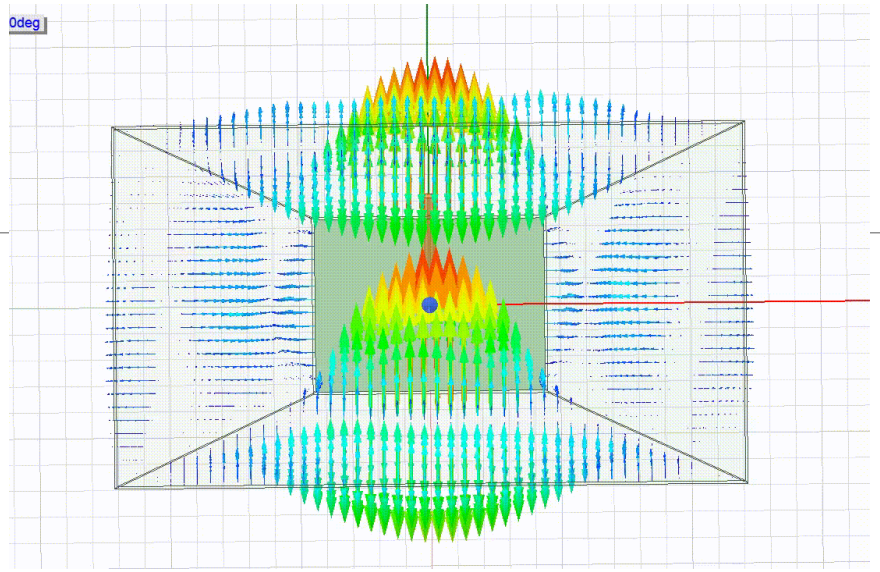
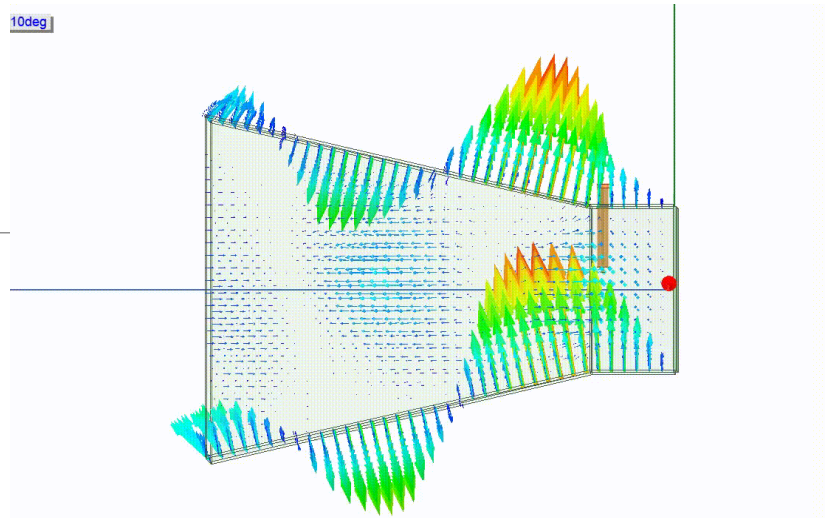
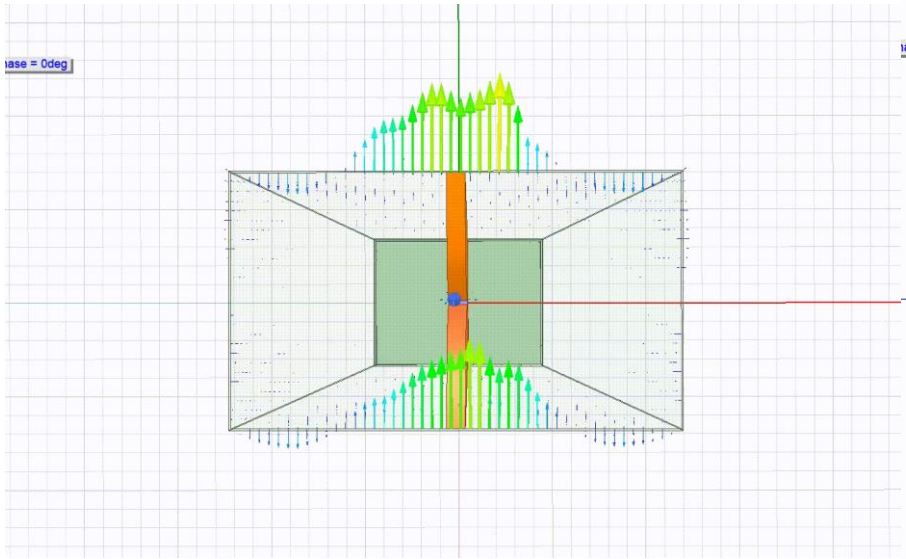
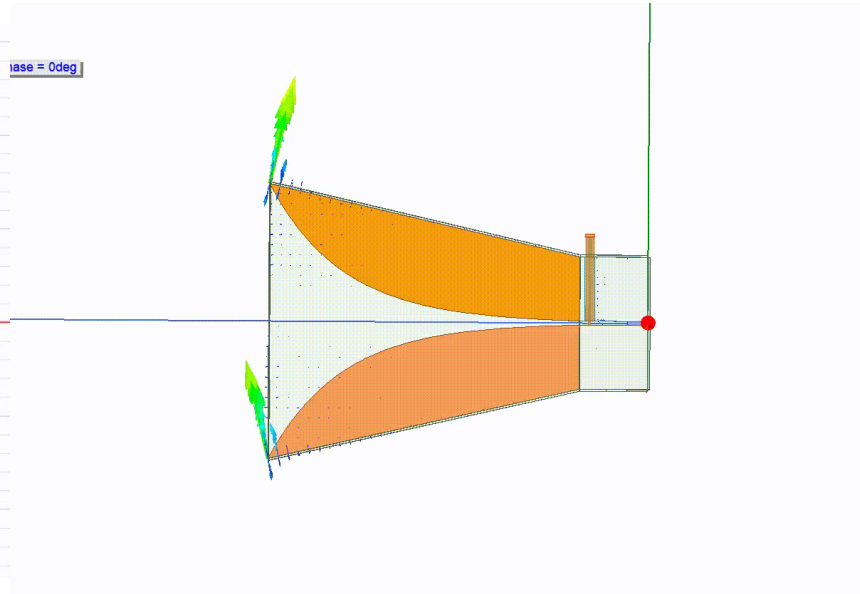
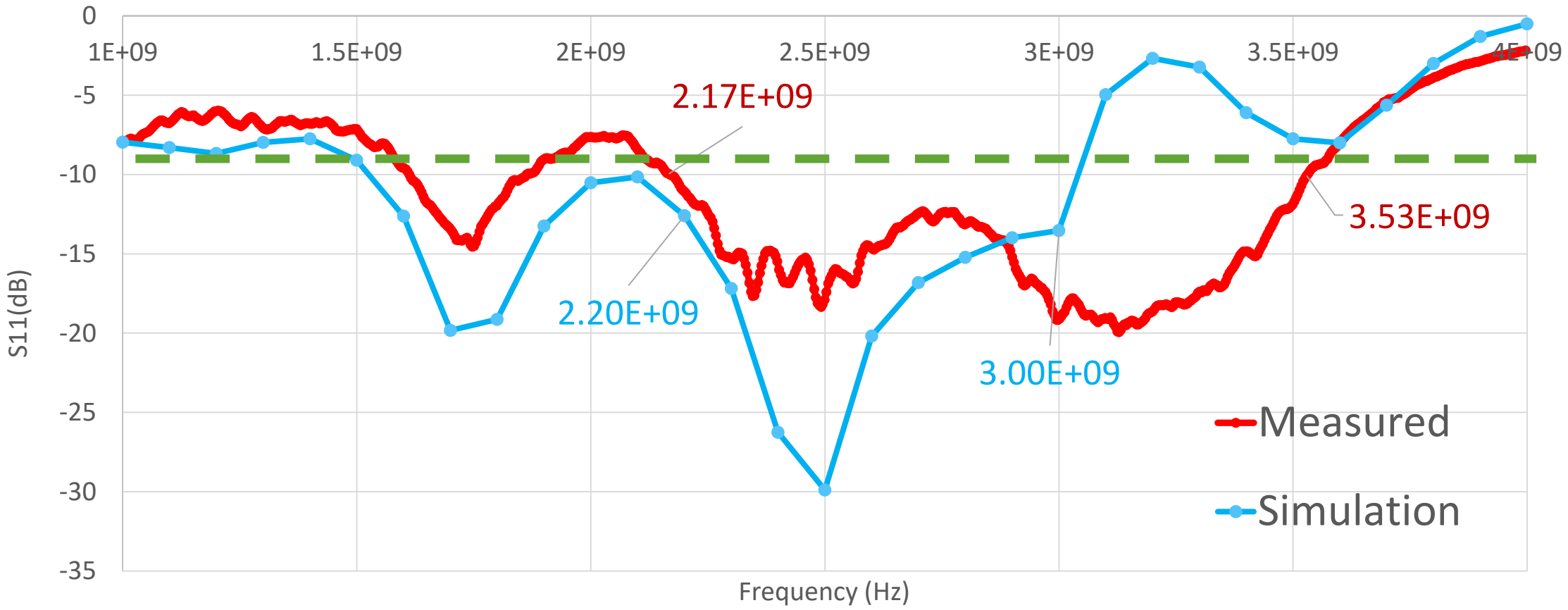






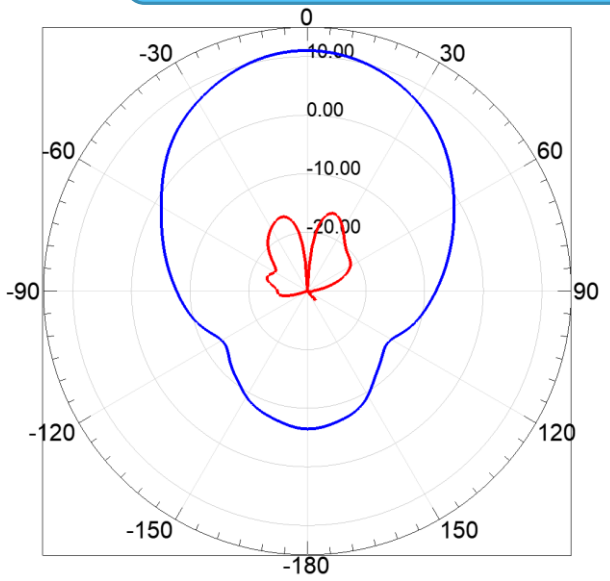


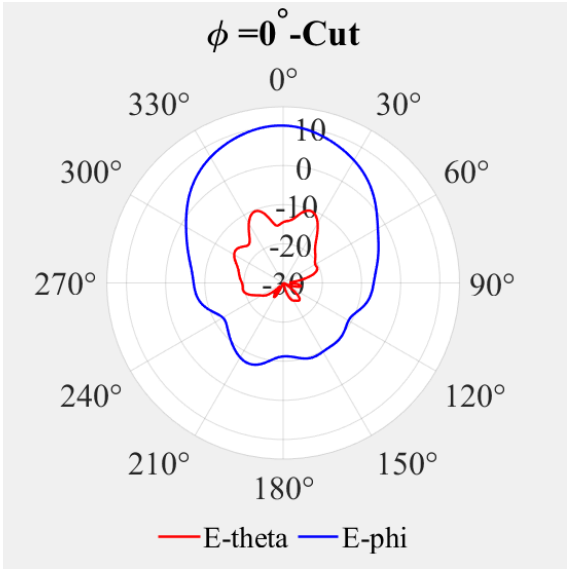
Results: S11


0
-5
-10
-15
-20
-25
-30
-35
S11(dB)
1E+09
1.5E+09
2E+09
2.5E+09
3E+09
3.5E+09
4E+09
Frequency (Hz)
2.17E+09
2.20E+09
3.00E+09
3.53E+09
Measured
Simulation

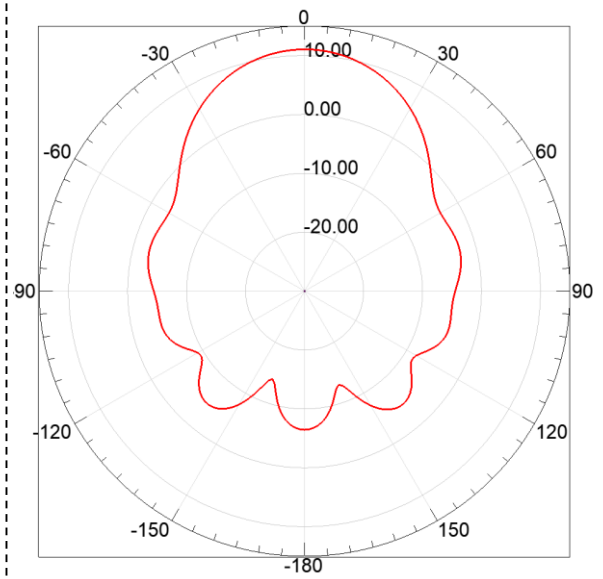
Pattern @ 2.45GHz

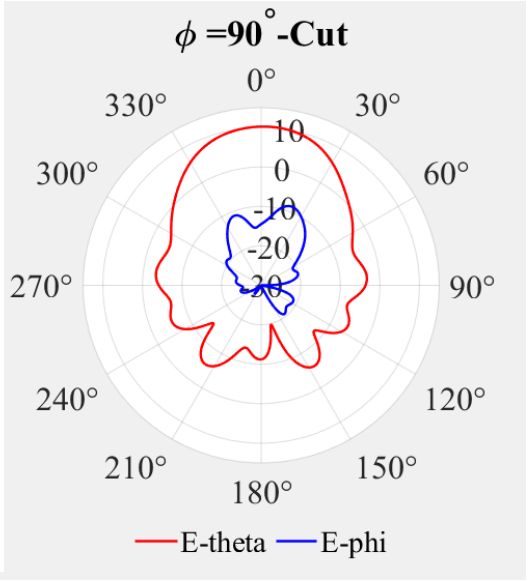
$\emptyset = 0^o$





$\emptyset = 90^o$





	$\emptyset = 0^o\ (Sim.)$	$\emptyset = 0^o\ (Mea.)$	$\emptyset = 90^o\ (Sim.)$	$\emptyset = 90^o\ (Mea.)$
Gain(dB)	11.02	10.2	11.02	10.2
Beam Width	55^o	53^o	44^o	51^o

Conclusions

The proposed Horn

- BW: 2.1~3 GHz
- Gain: 10.2 dB @2.45 GHz
- Beam Width: 55^o

Suitable for Fixed Wireless Application