Tianlai Beam Pattern Simulations Update

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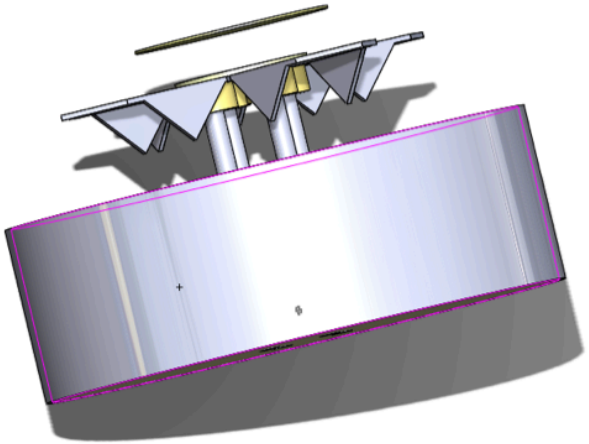
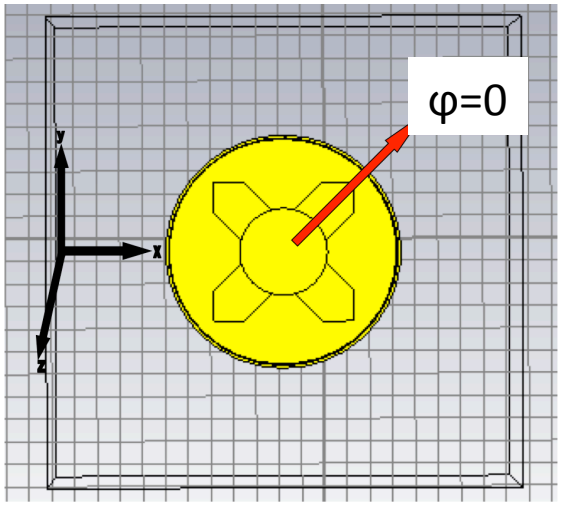
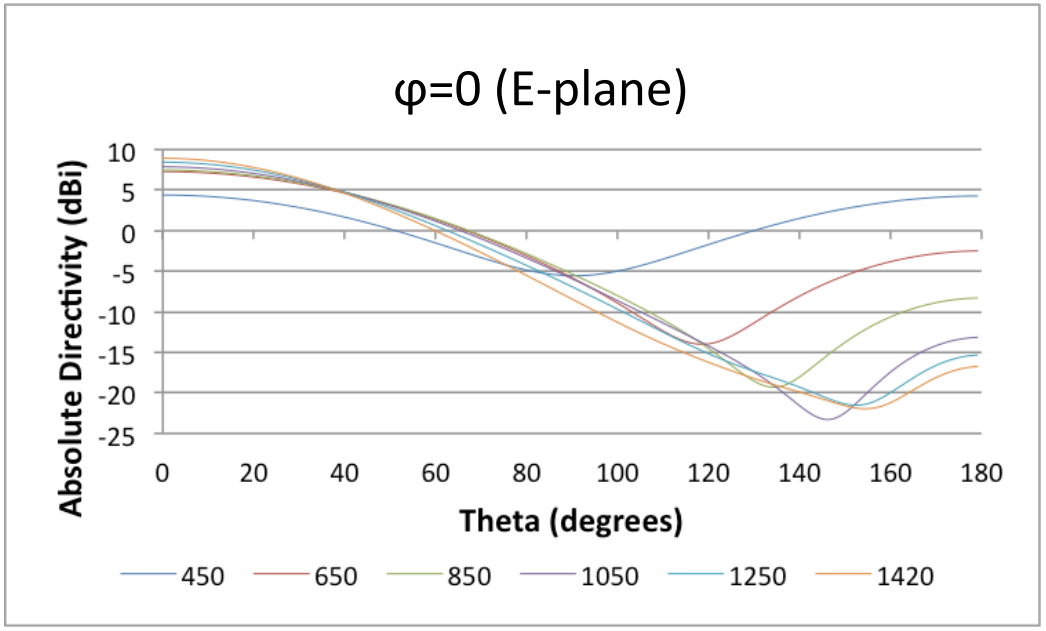
Beam Pattern Simulations

- single ‘coffee-can’ feed
- linear array of 81 feeds – no reflector
- linear array of 81 feeds – with reflector

Single ‘coffee can’ feed antenna

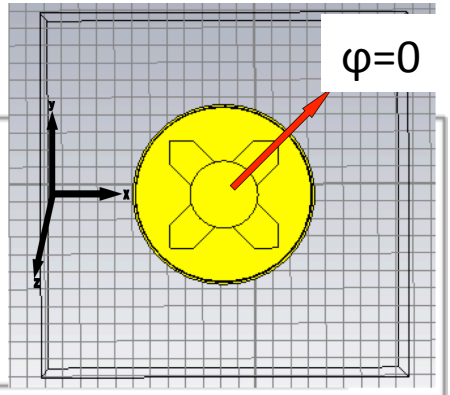




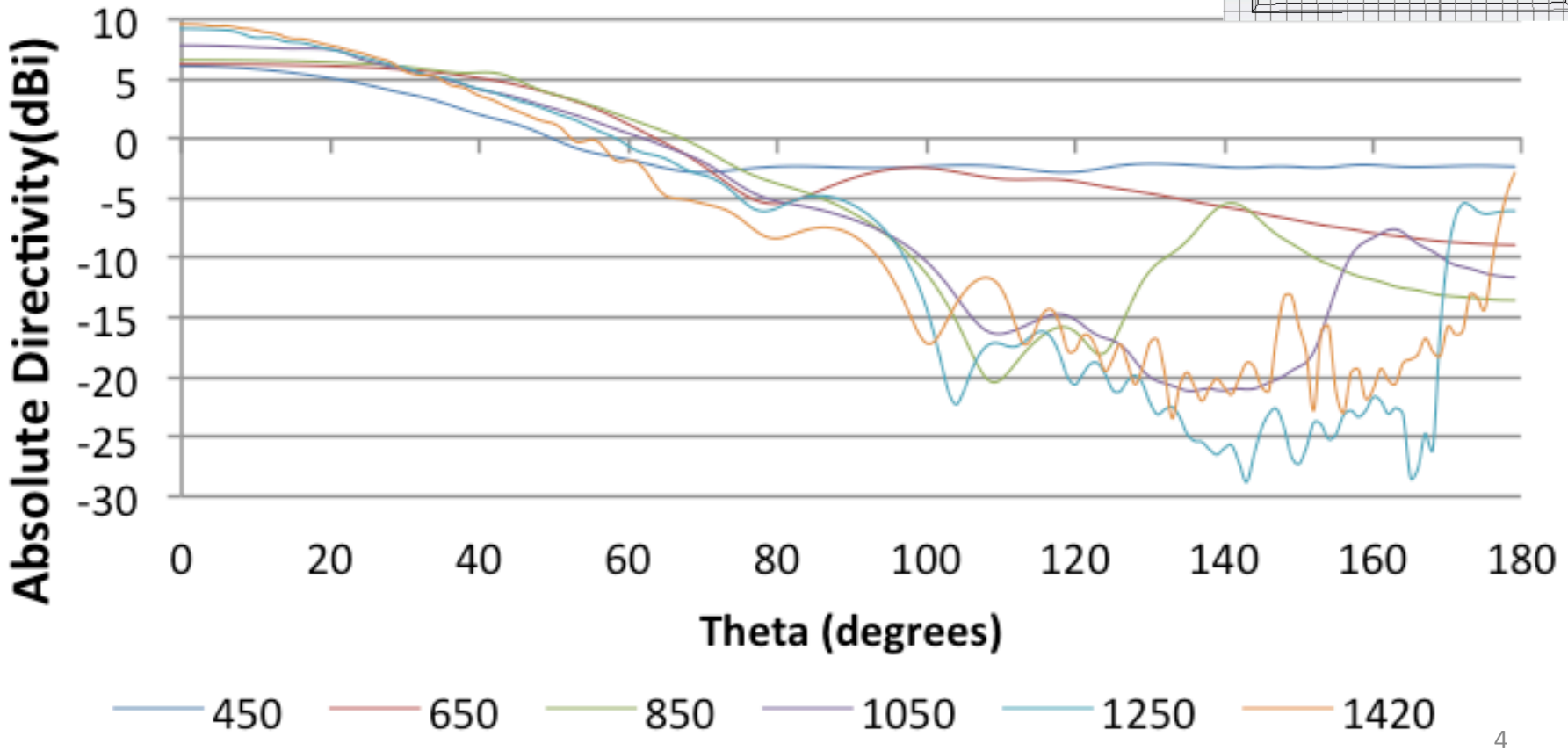


Pattern from center feed antenna in linear array of 81 coffee can feeds (without cylinder)

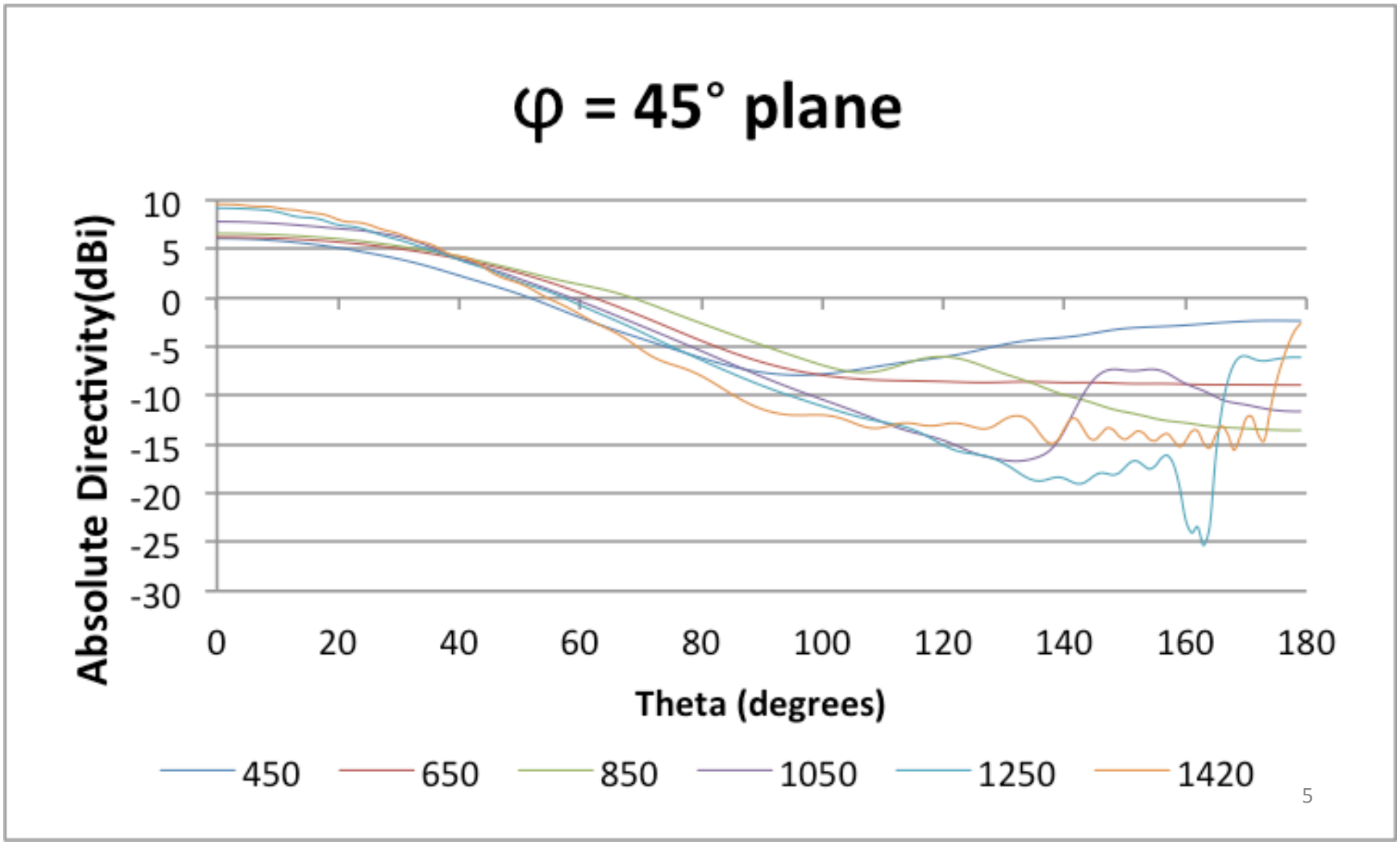
Feeds are adjacent to each other (1mm gaps)



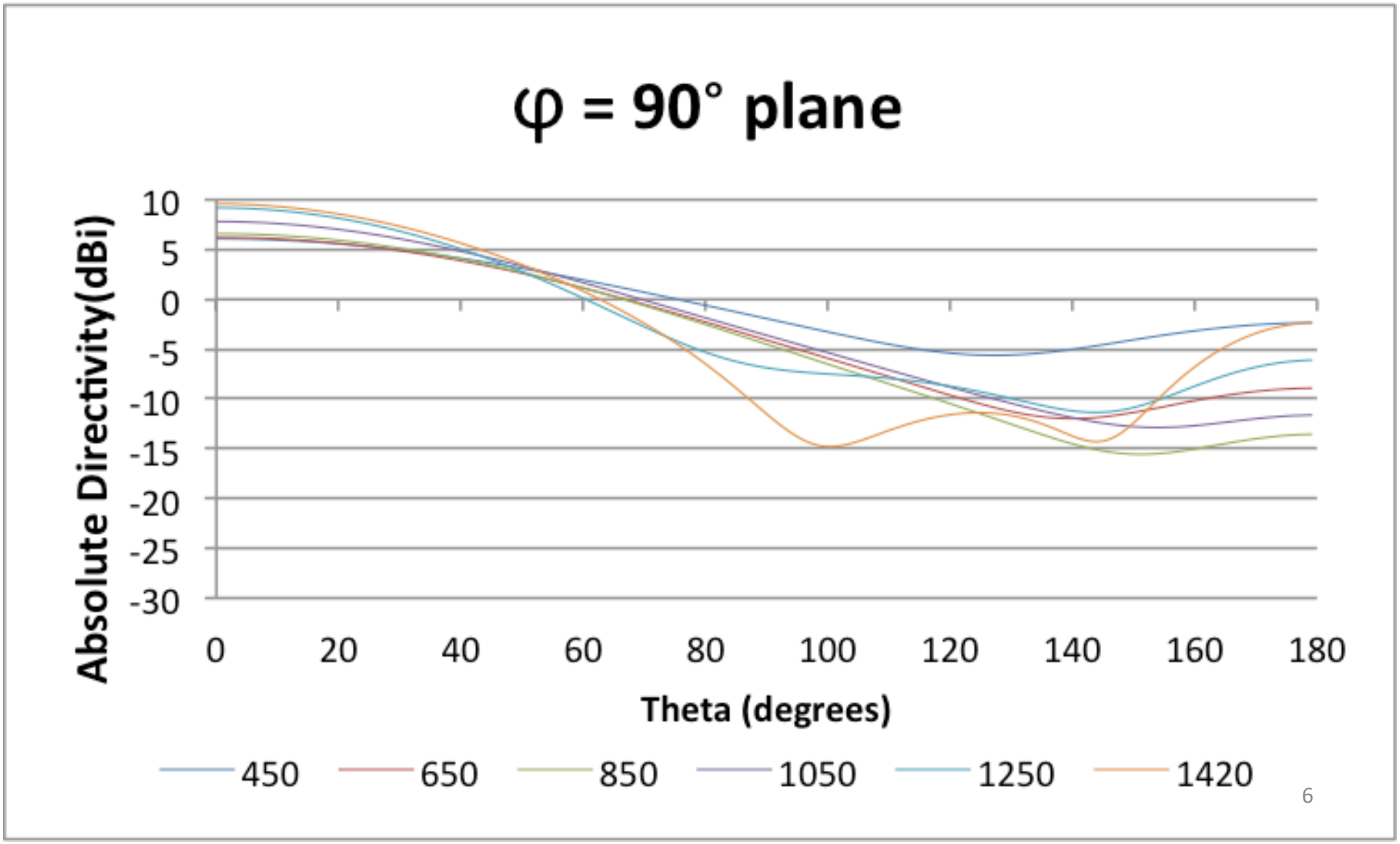
φ=0 (E-plane)



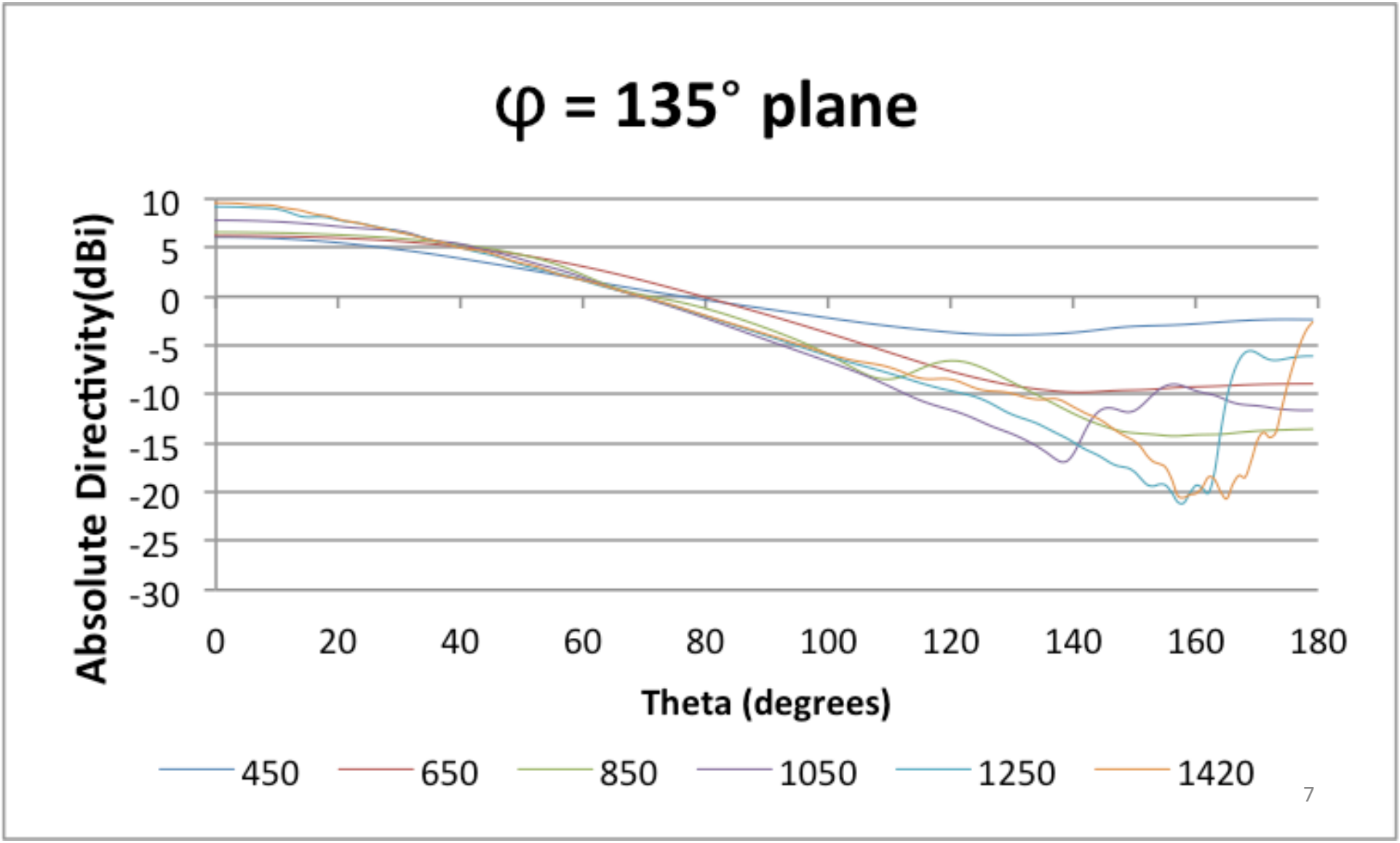
81 Coffee can antennas



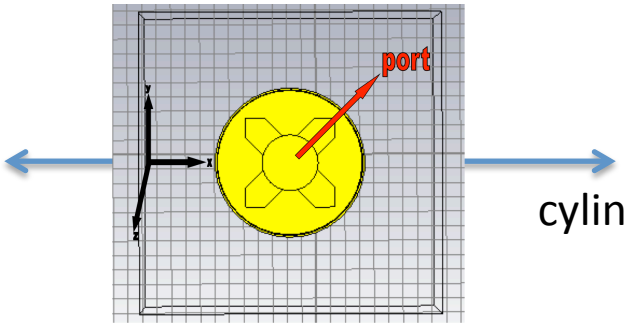
81 Coffee can antennas



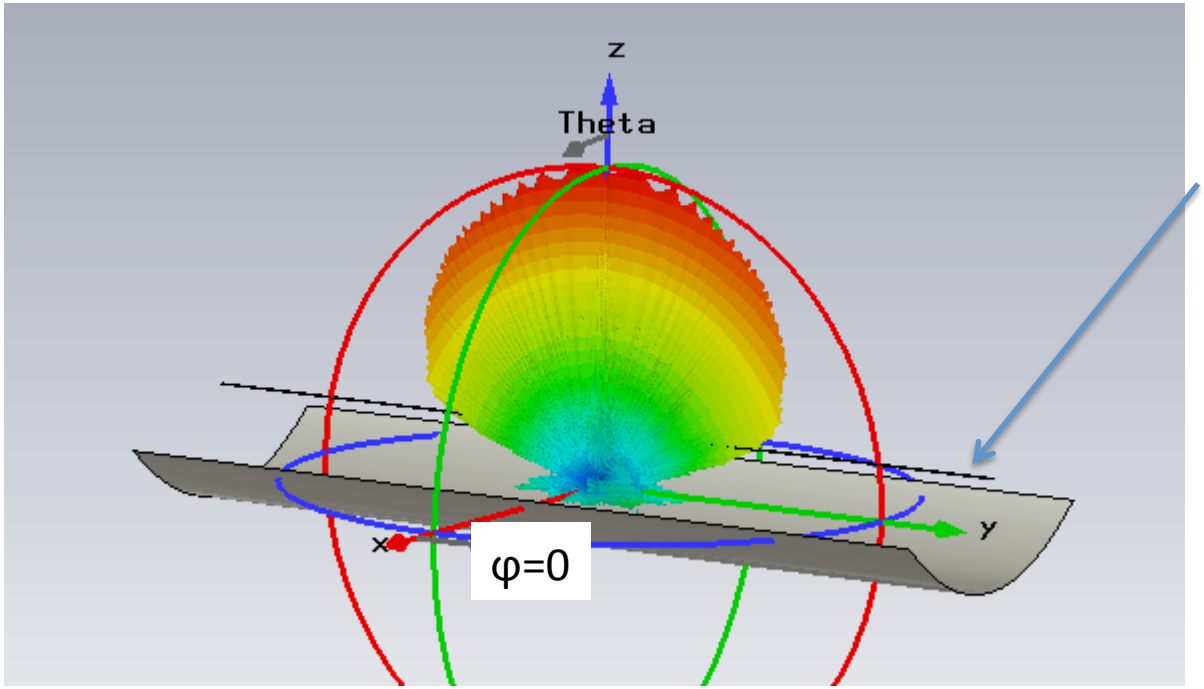
81 Coffee can antennas



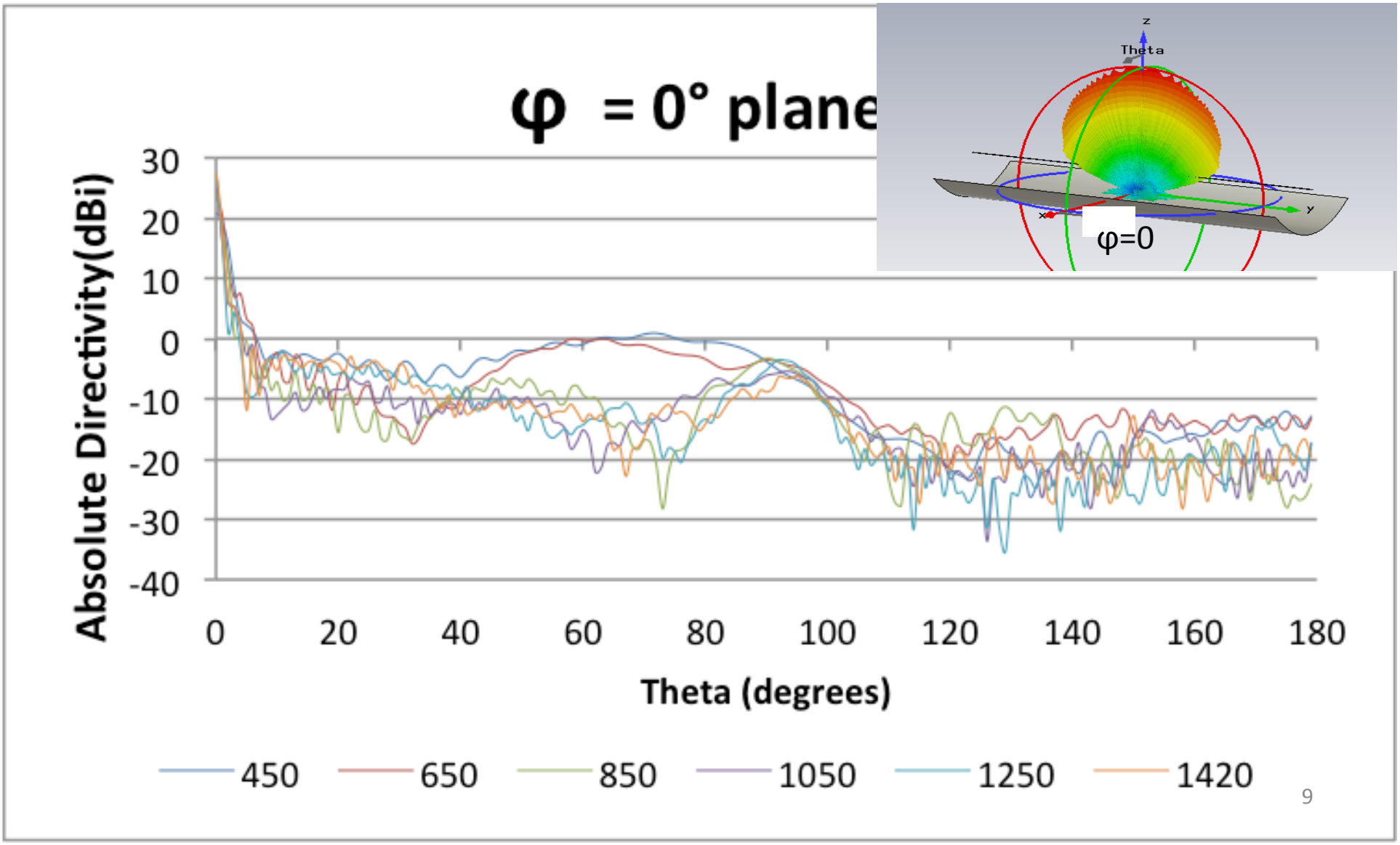
Linear array of 81 coffee can feeds with cylinder reflector



Feeds are adjacent to each other (1mm gaps)
Dipoles are oriented 45^0 to cylinder axis
Model includes blockage from feed support structure



81 Coffee can feeds + Cylindrical reflector
Pattern from Center Feed



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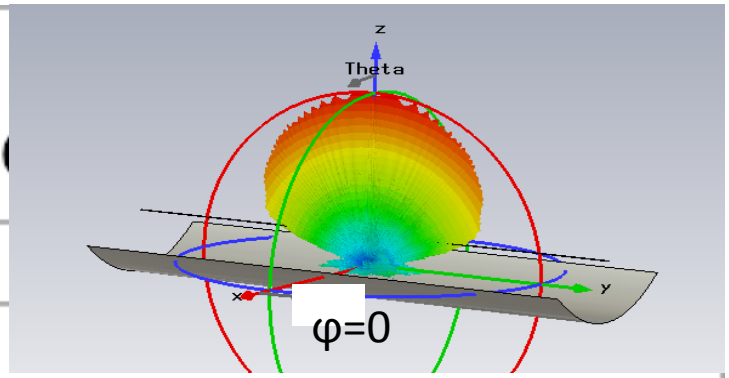

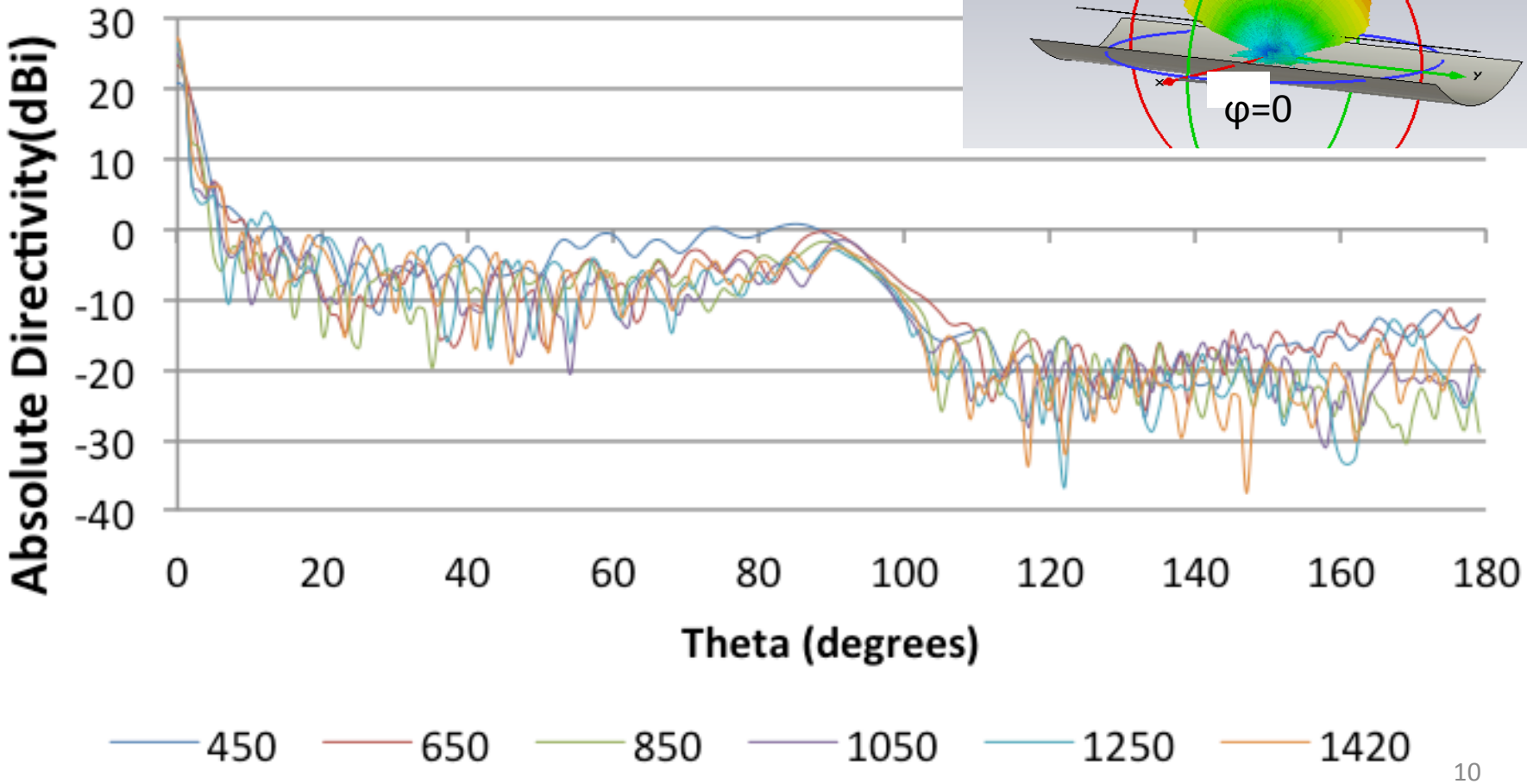

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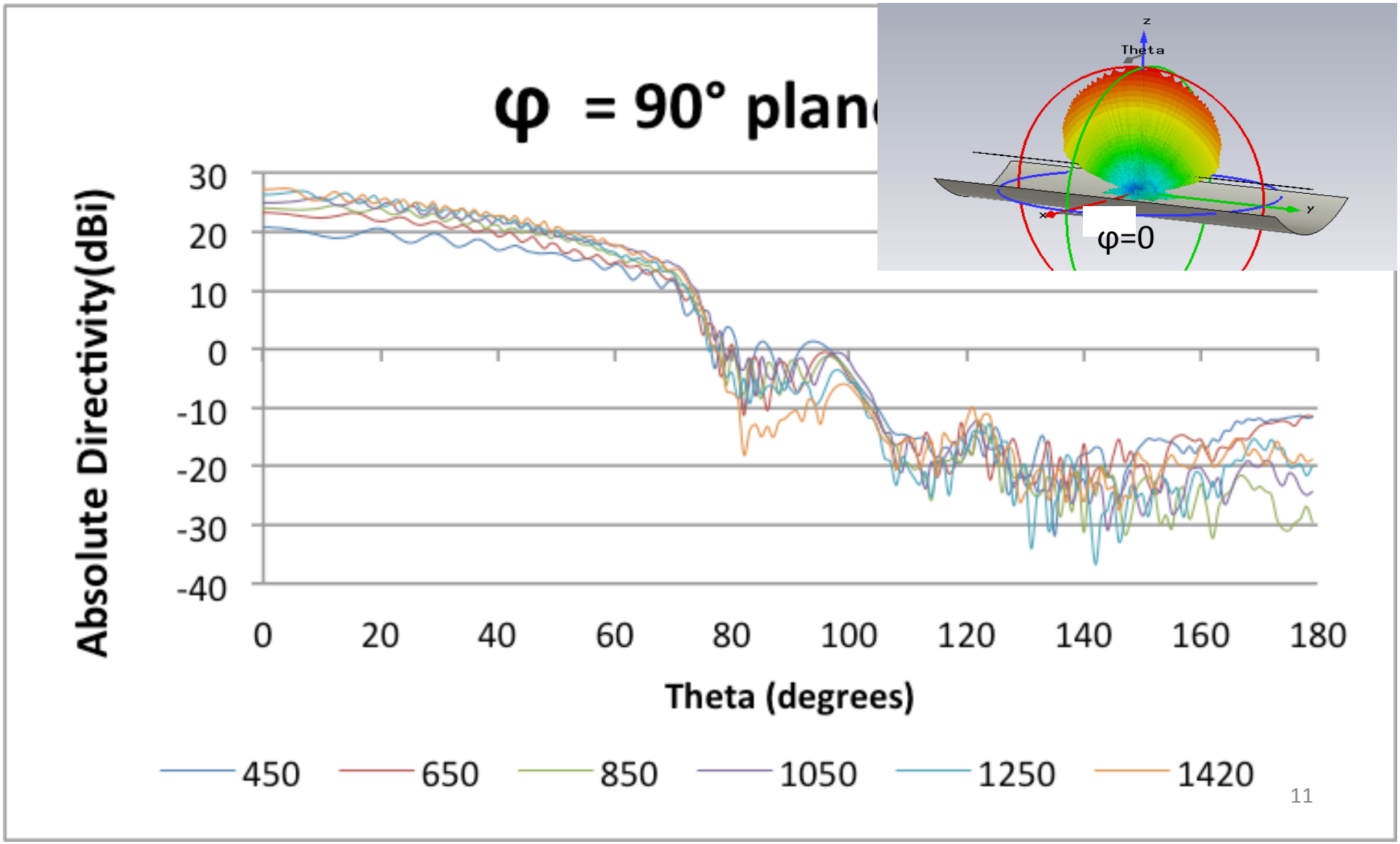

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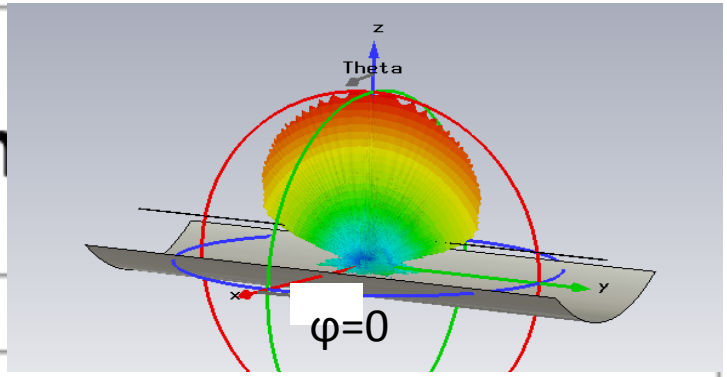

Next steps

- Include correct number and spacing of feeds on cylinder
- Include cross-polarization
- Compare to previous results from Tao Liu
- Compute T_{spill}
- Complete scale model feeds and cylinder
- Measure patterns of scale model, compare with simulations
- Write up simulations and scale modeling as an engineering paper
  - Include co-authors in collaboration who want to participate,
  - Including CETC 54
- Investigate quad-copter beam pattern further