Scale model of Tianlai cylinder

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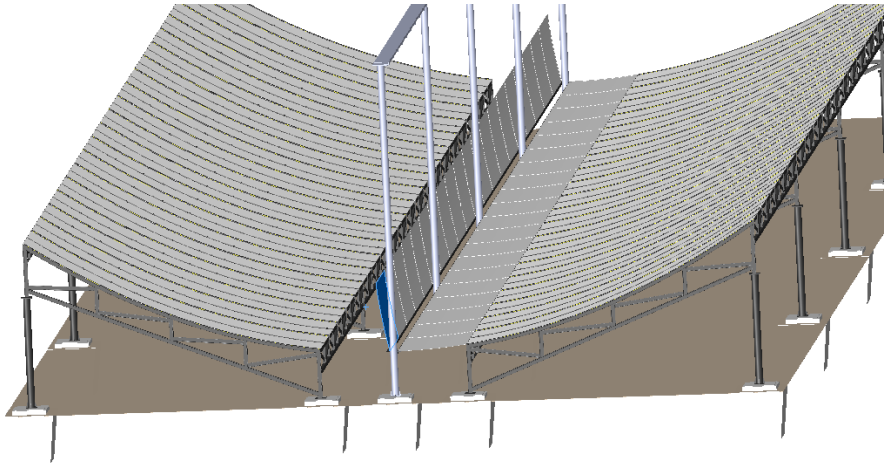
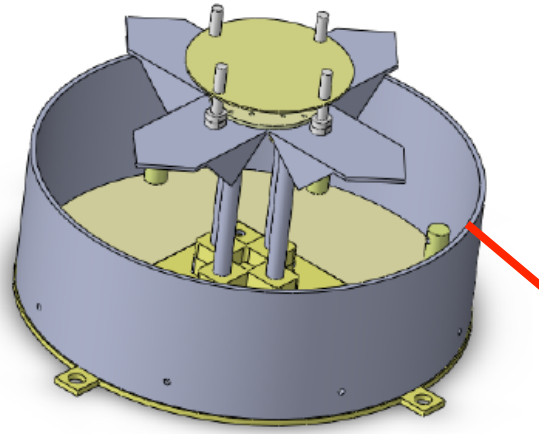
- Scale by factor of 10.5: 15 m x 40 m → 1.5 m x 4 m

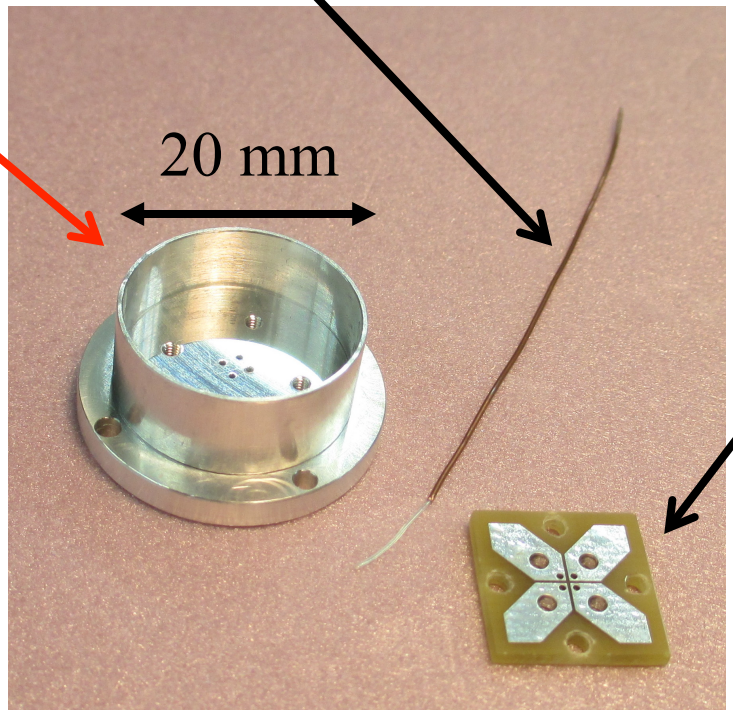


Scale Model feed 10.5 X smaller



'coffee can'
four-square feed

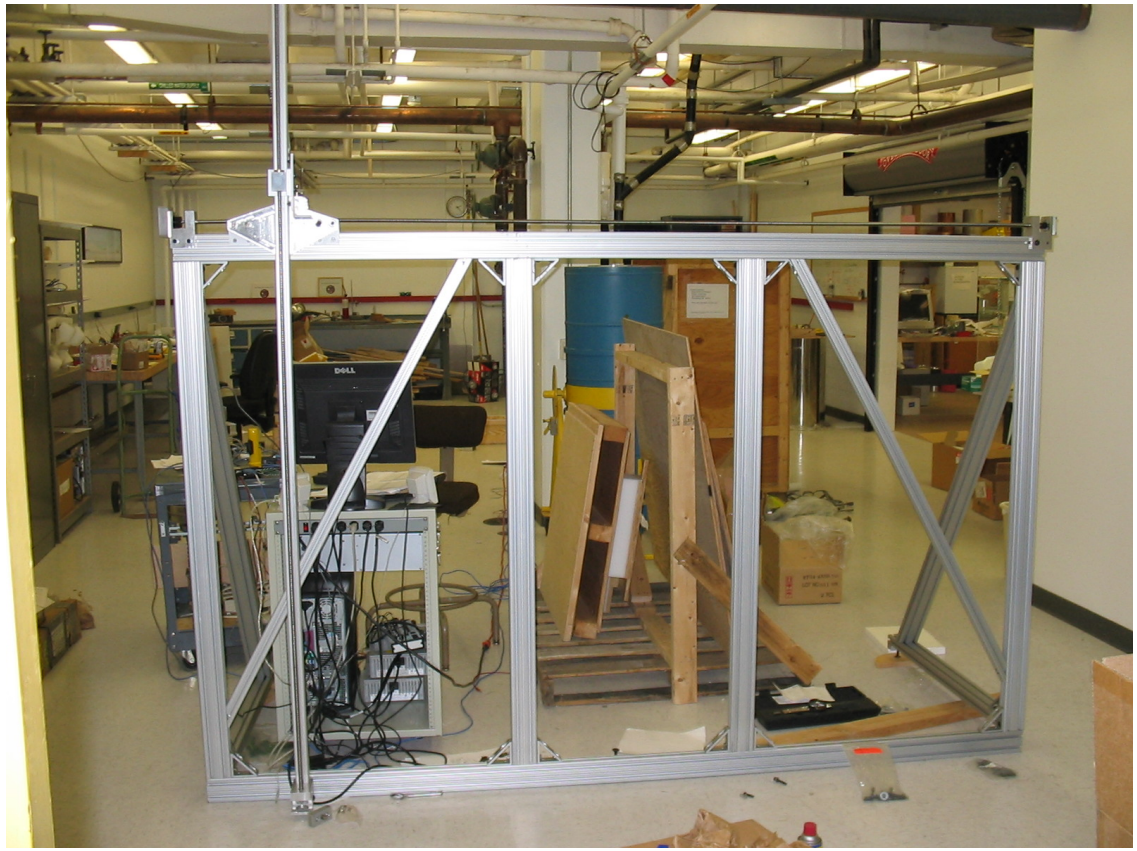
world's smallest
coax (0.5 mm dia)



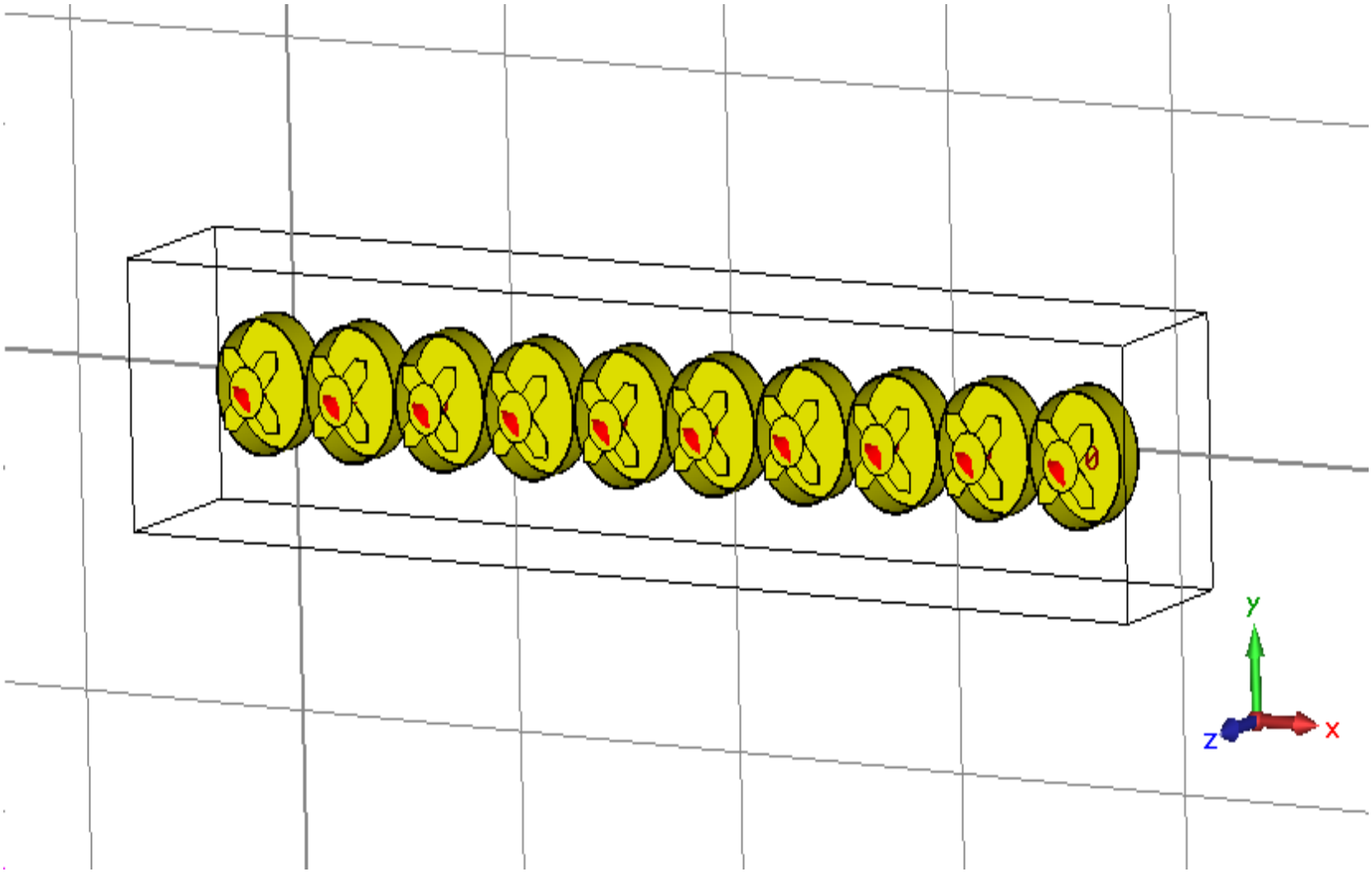
dipoles on
PCB

Measure near-field pattern

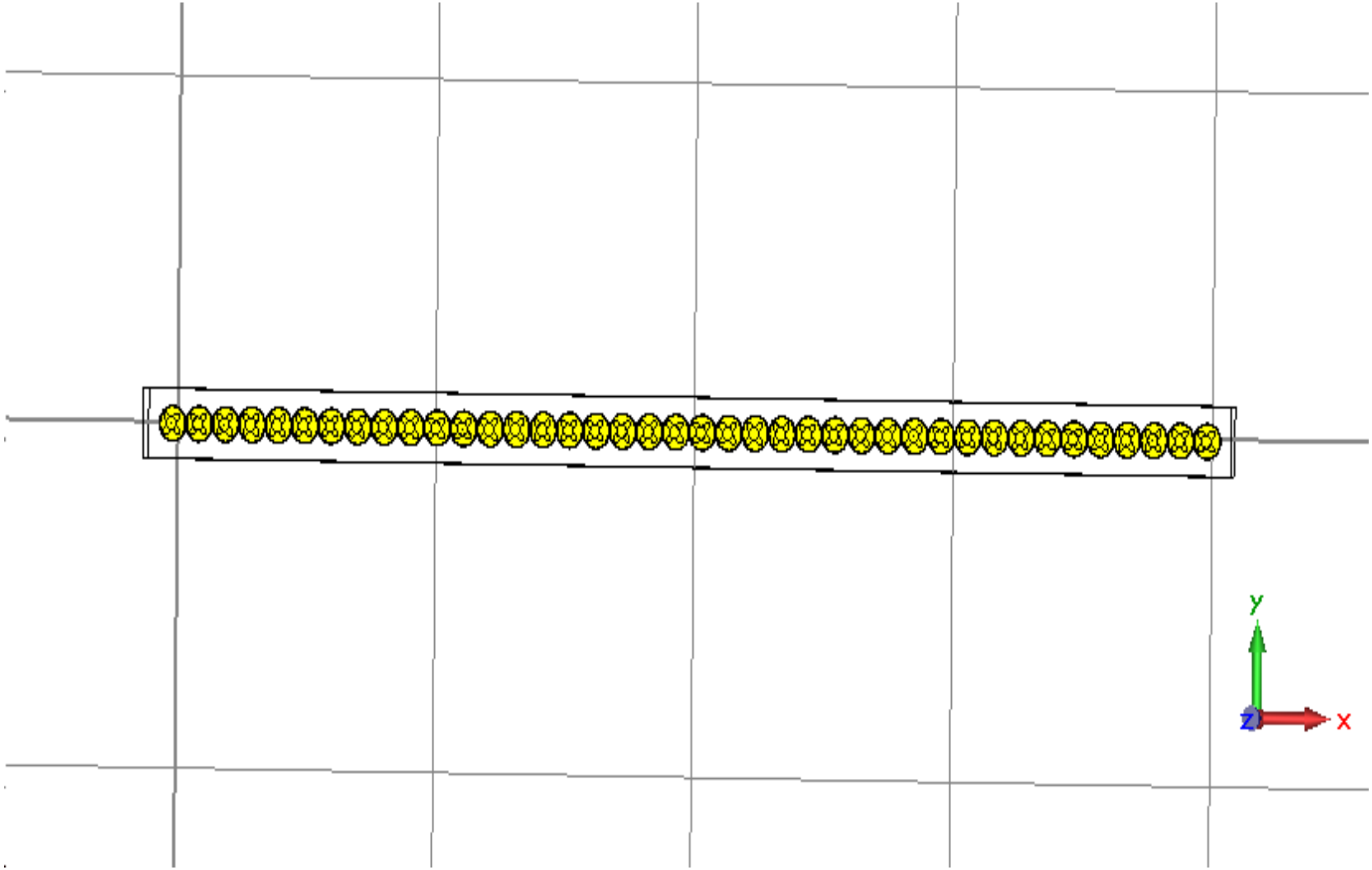
- Large x-y stage from Greg Tucker (Brown University)
- Scan transmitter or receiver from vector network analyzer
  in raster pattern just above cylinder aperture
- Measure E-field (amplitude and phase), FFT to get far field pattern
- Can we do same thing on full-scale cylinders?



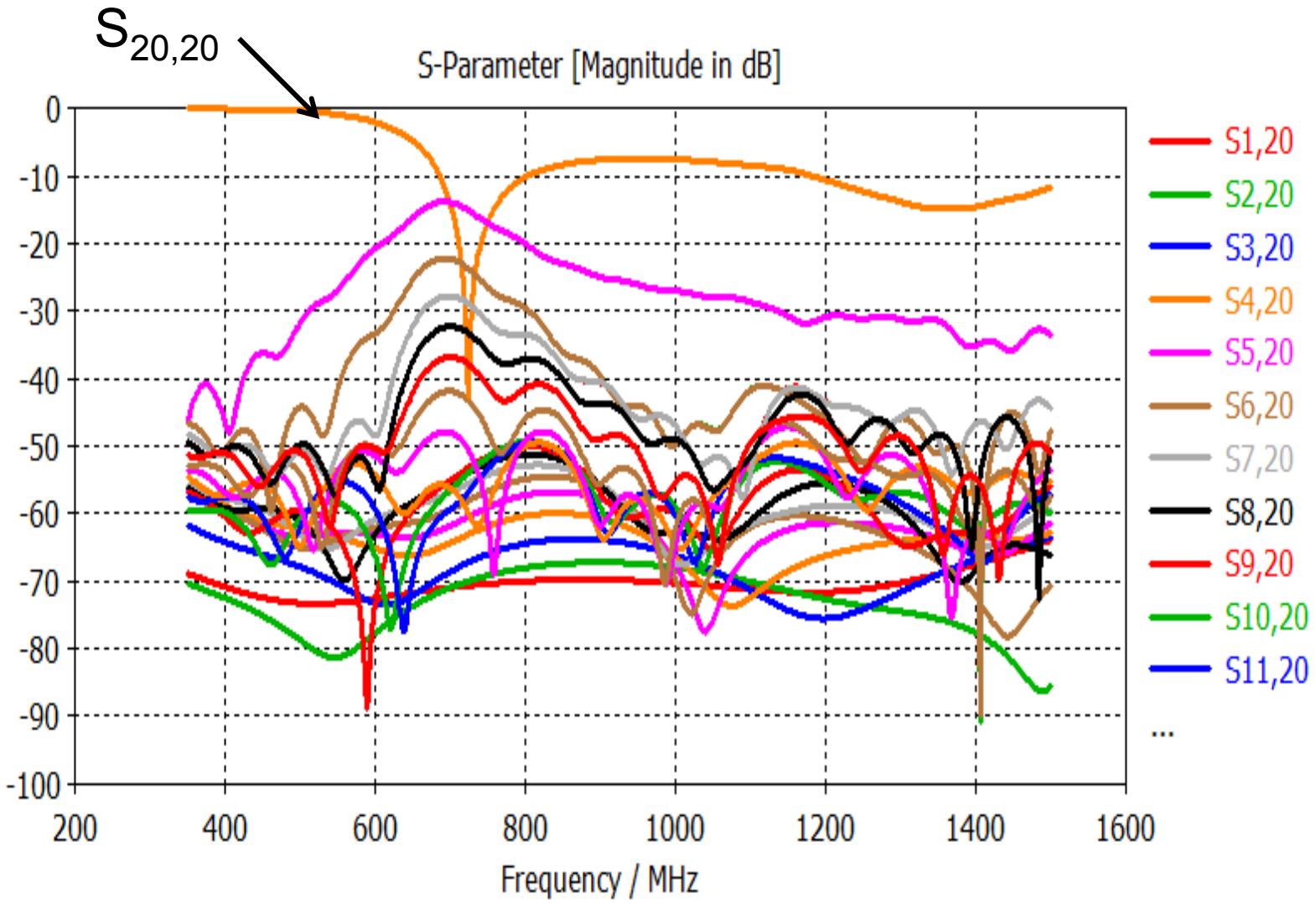
Coffeecan Simulation - 10 Antennas



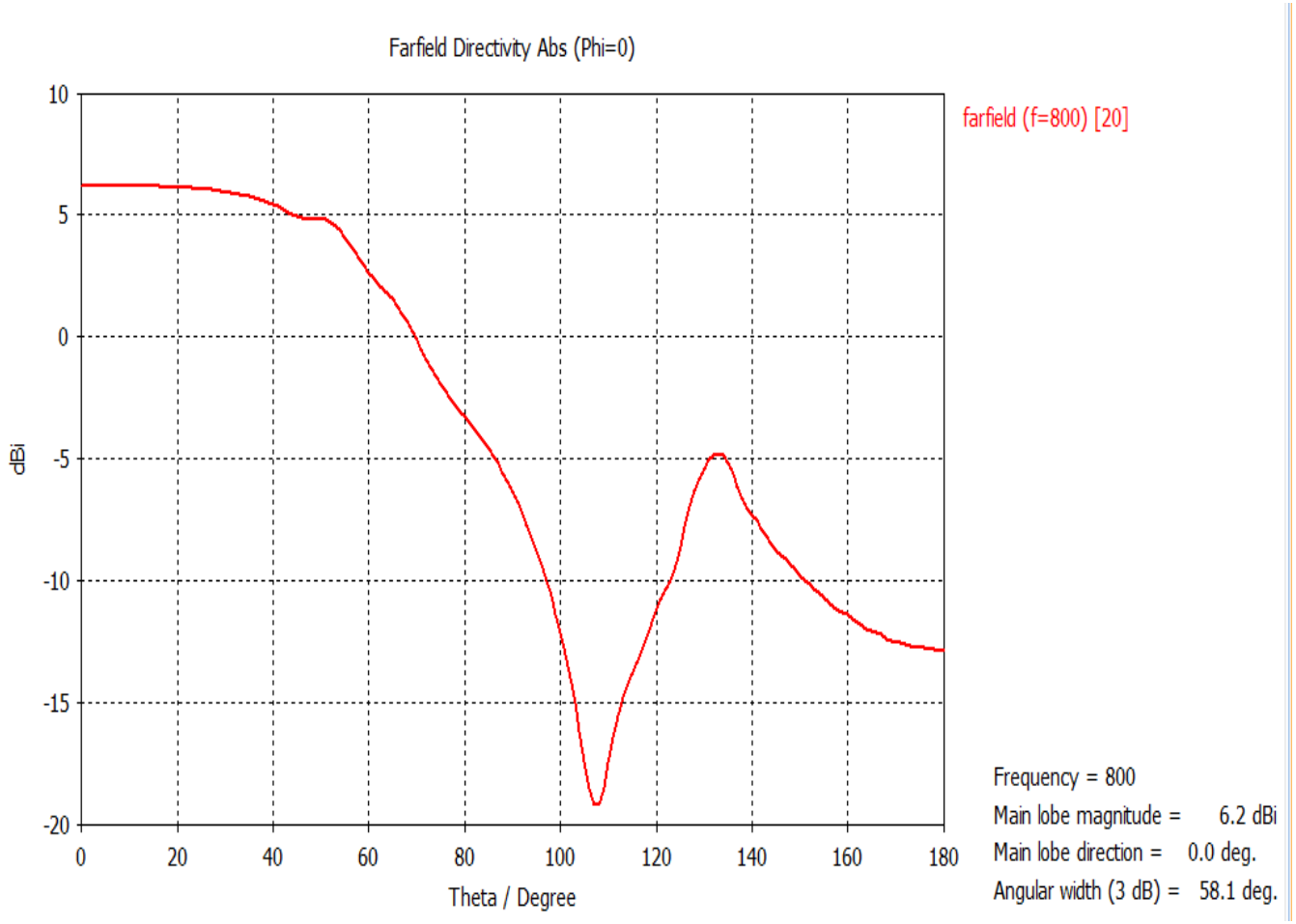
Coffeecan Simulation - 40 Antennas



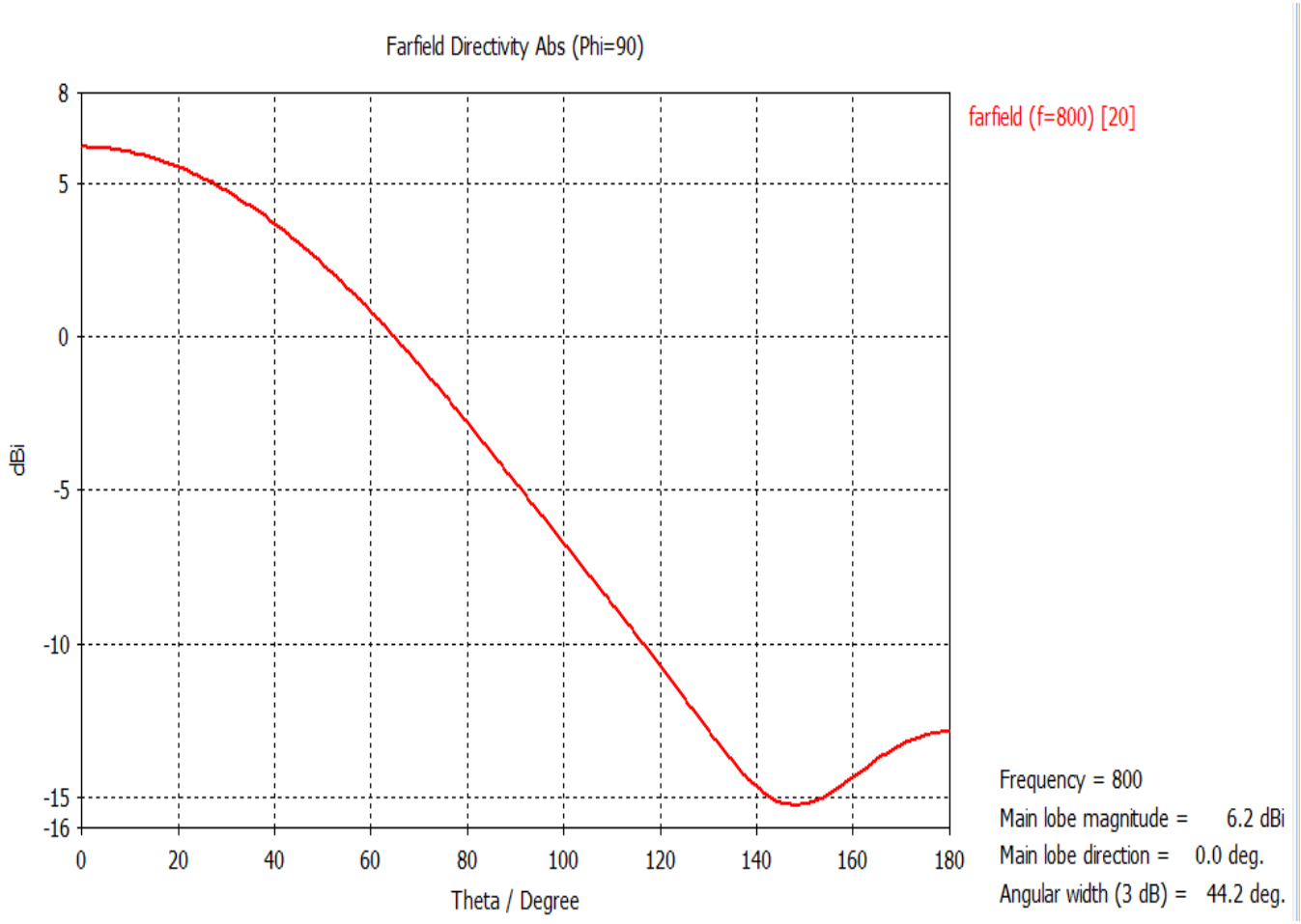
S-Parameters for 40 feeds



Feed Pattern Simulations
f = 800 MHz, phi = 0 (along long axis)



Feed Pattern Simulations
f = 800 MHz, phi = 90 (perpendicular to long axis)



Next steps

- Finish cylinder construction
- Assemble 2 scaled ‘coffee-can’ feed antennas
- Map beam patterns of scaled feeds
- Install one feed on cylinder
- Indoor near-field measurement