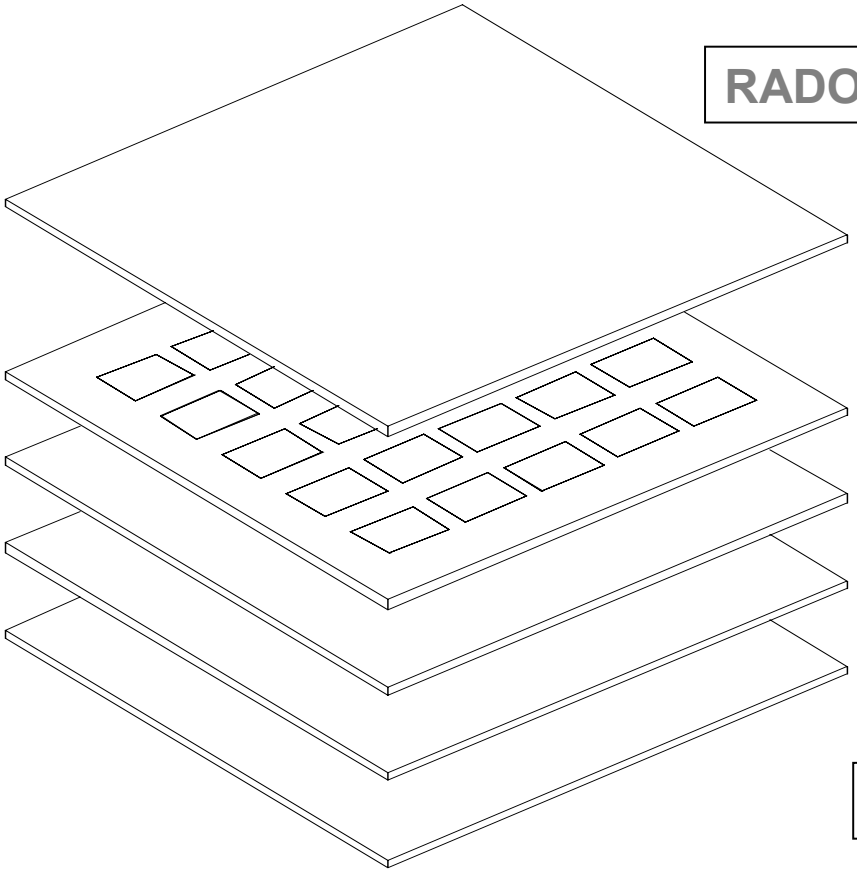
Part II - Aperture-coupled Microstrip Patch Array

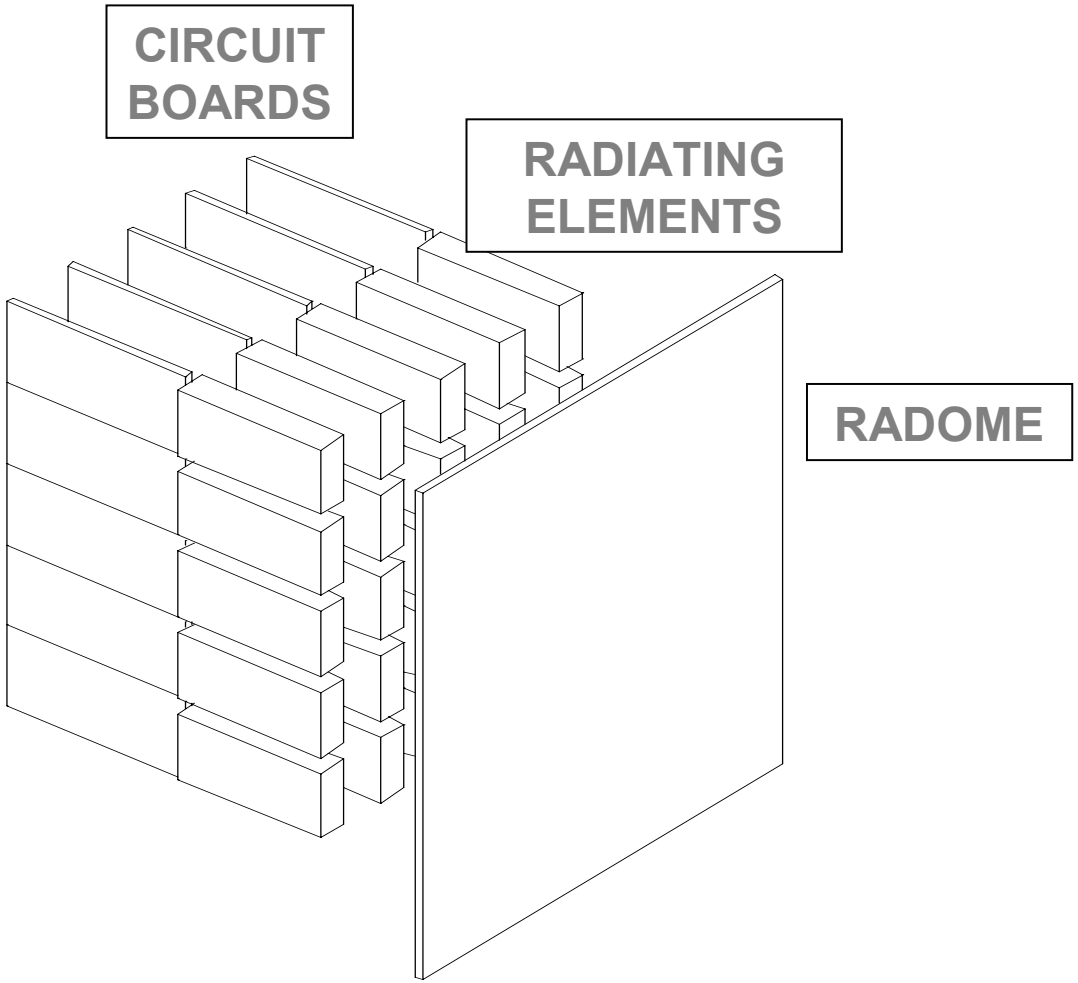
Outline

- Basic antenna architectures
  - Brick-type / Tile-type
- Examples of microstrip patch radiators for 20GHz and 30 GHz operation
  - Simulated RF-properties and radiation characteristics
- Circular polarization with linear polarized elements
  - Simulated Radiation characteristics
- Possible array configuration
  - Simulated Radiation characteristics with Dolph-Tschebyscheff distribution

Tile-Type Array Architecture



Brick-Type Array Architecture



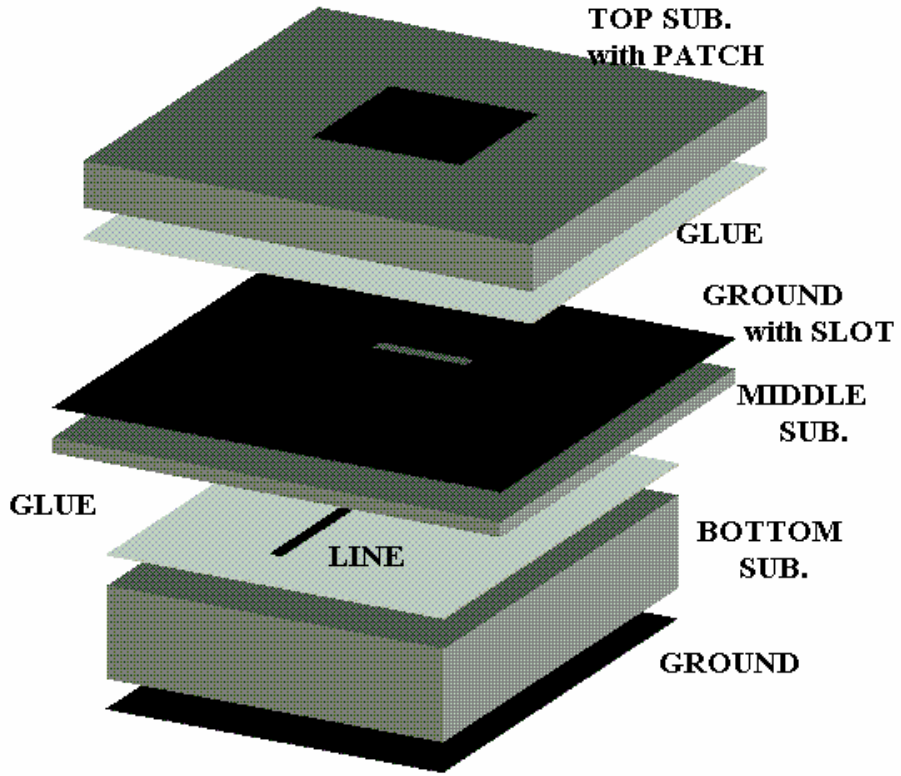
Ka-Band Array Elements for 20 GHz and 30 GHz Operation

20GHz Version:

RTDuroid 5880 ε_r=2.2

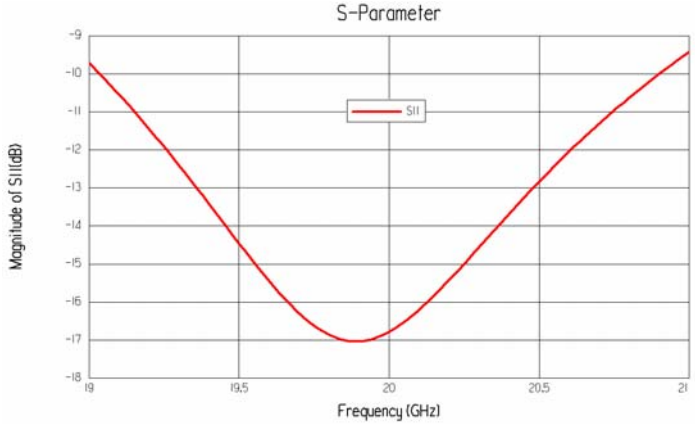
RT6010 ε_r=10.2

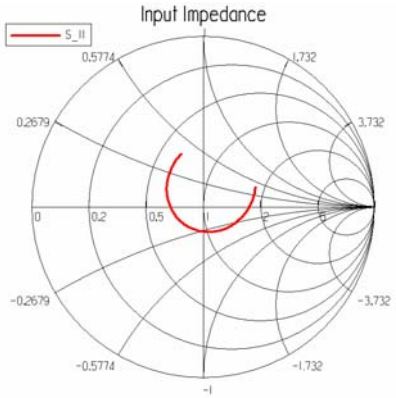
RT/Duroid 5870 ε_r=2.33

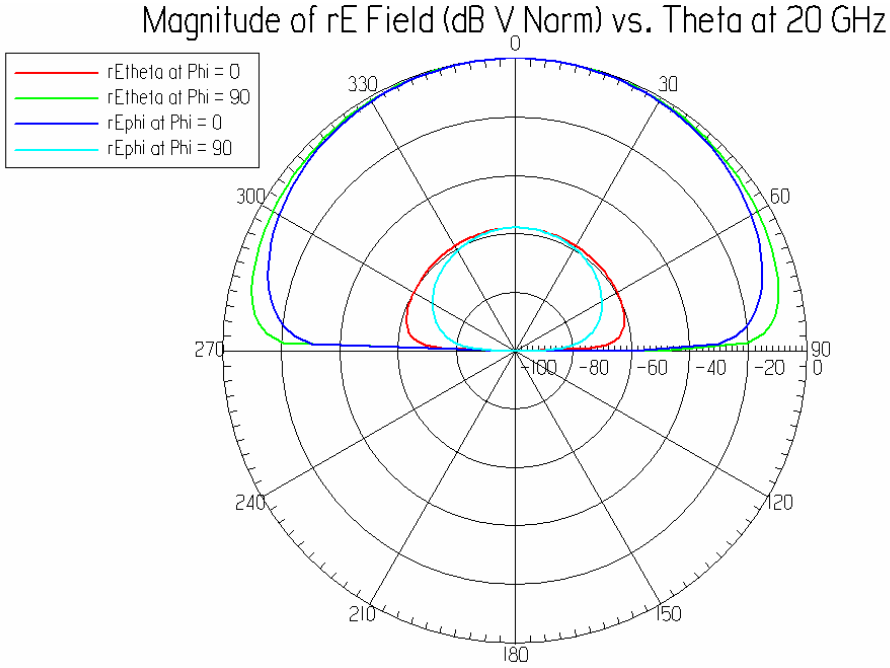


Ka-Band Array Elements for 20 GHz and 30 GHz Operation

20 GHz Version

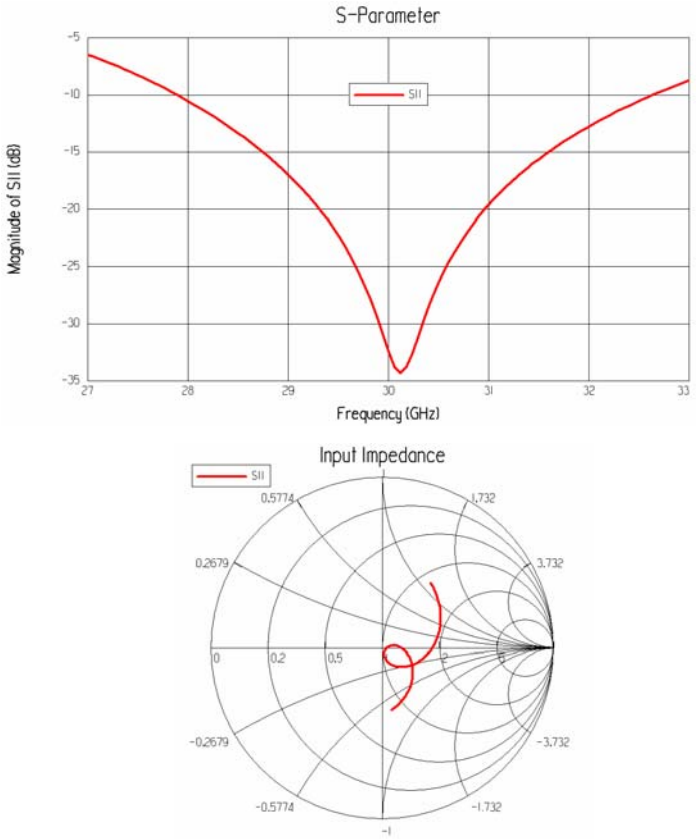


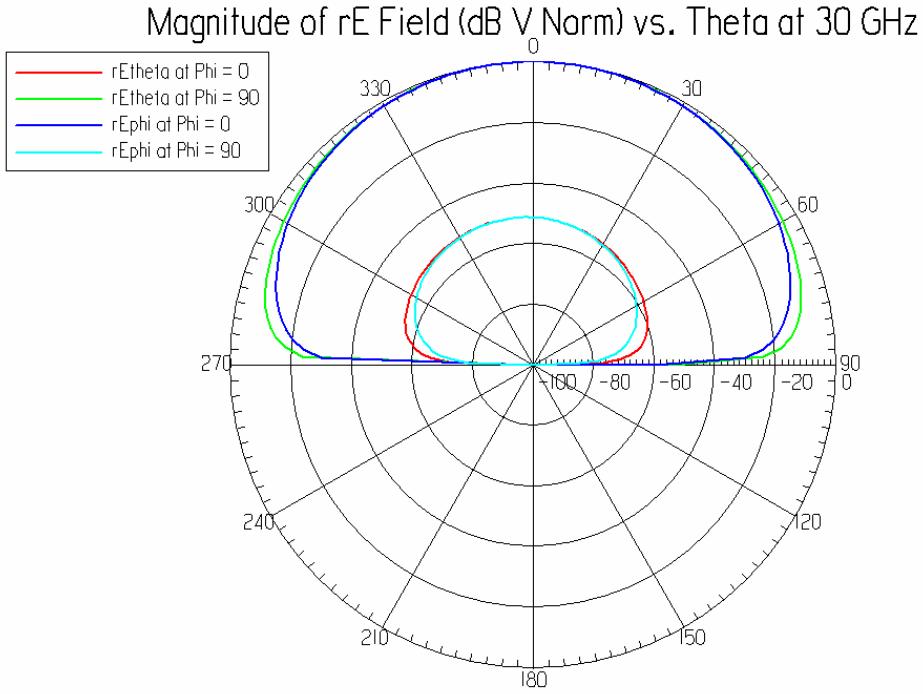




Ka-Band Array Elements for 20 GHz and 30 GHz Operation

30 GHz Version





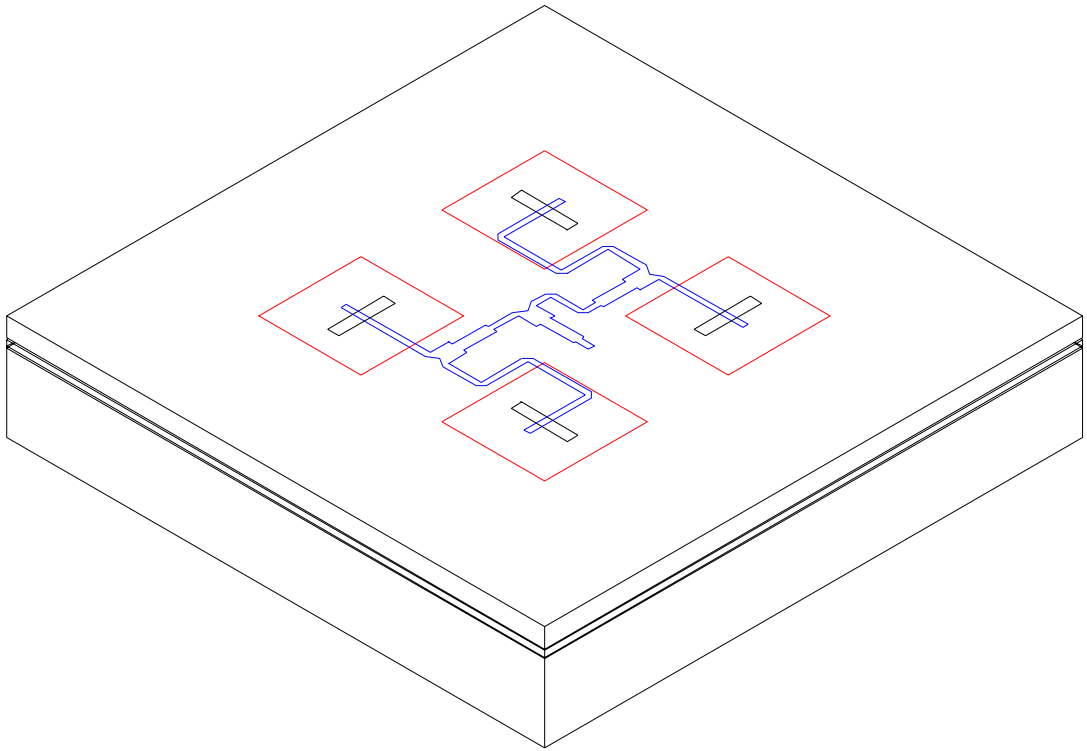
Analysis of radiation pattern effects in sequentially rotated arrays

Subarray-setup for 20 GHz operation

RT/Duroid 5880 ε_r=2.2

RT6010 ε_r=10.2

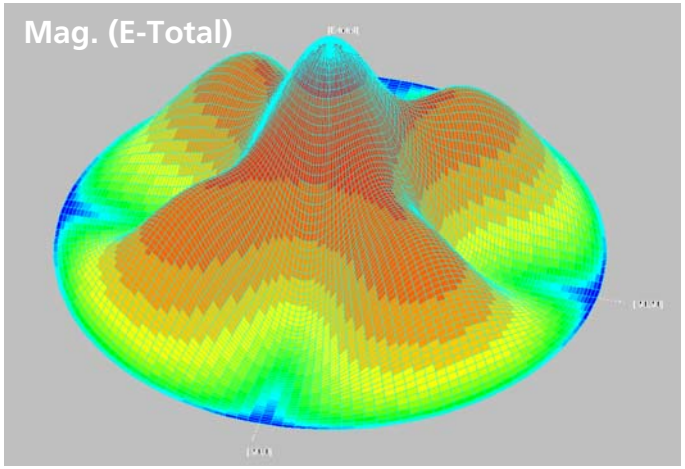
RT/Duroid 5870 ε_r=2.3

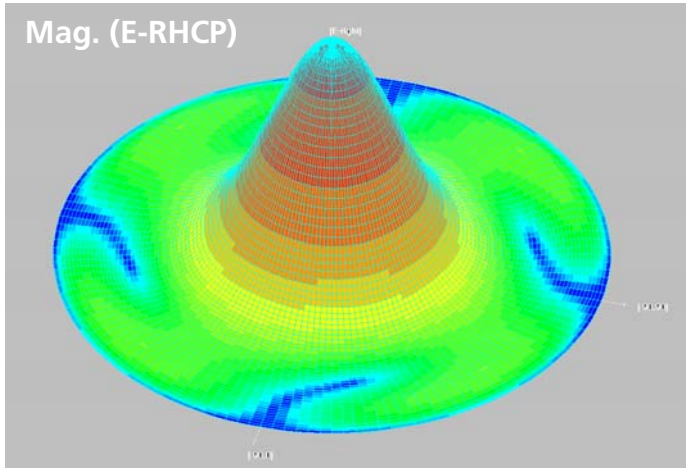


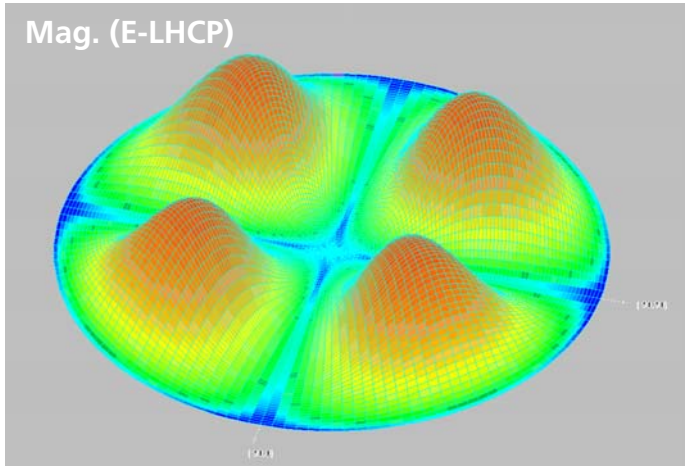
Analysis of radiation pattern effects in sequentially rotated arrays

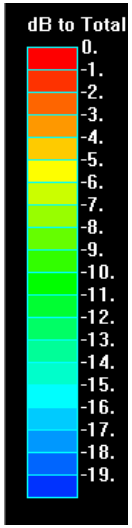
Ansoft Ensemble Results for the

20 GHz Version





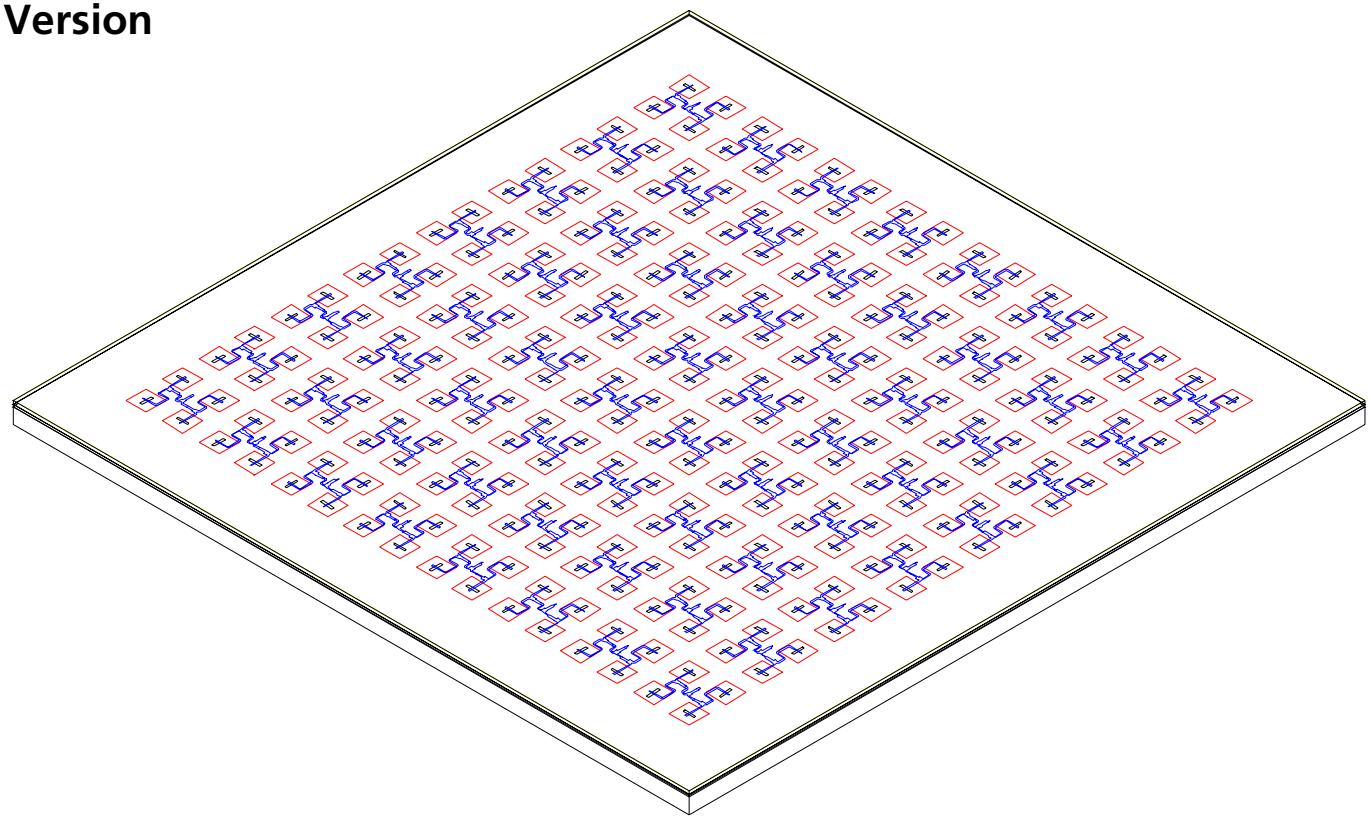




Analysis of radiation pattern effects in sequentially rotated arrays

Array-Example with 8 x 8 Subarrays:

20 GHz Version

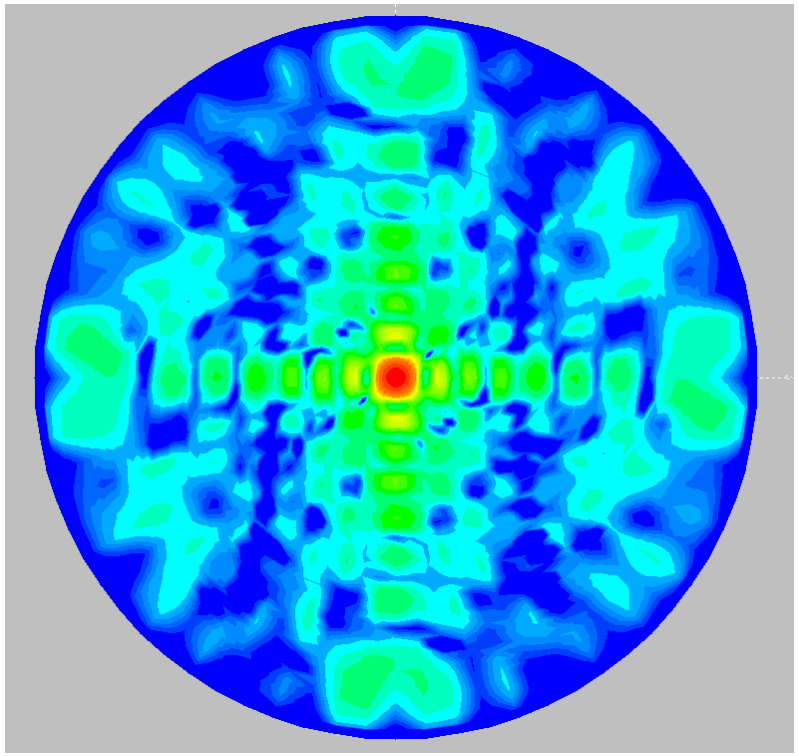


Analysis of radiation pattern effects in sequentially rotated arrays

Array-Example with 8 x 8 Subarrays - Subarray distance = 0.75λ

Dolph-Tschebyscheff-Distibution:

Scan angle Θ = 0° and Φ = 0°



Dolph-Tschebyscheff-Distibution: