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Broadband Quad-Ridge Horn Antennas

In the most recent decades, material characterization has evolved into the microscopic scanning field. Modern sensors are capable of applying electromagnetic radiation to obtain characterization data on set materials. However, current technologies require rotating sensors or sample adjustments. This causes problems in measurements because it risks distorting images and attaining imprecise data. Therefore, there is an apparent need to create a stationary antenna that is capable of producing principle polarizations.

Researchers at Arizona State University have produced a quad-ridge horn antenna design to produce Gaussian-like beams for material measurements. The compact admittance tunnel allows for accurate and static measurements. And due to the outputs, the beams are capable of producing both principal polarizations. The dual polarization speeds up measurements since there is no need for physical rotation of the antenna or sample. Also, the antenna is able to measure anisotropic, or directional specific, materials.

Issued Patent: [U.S. Pat. No. 10,714,834](#)

Potential Applications

- Measuring material properties of a sample
- Measurements of anisotropic materials
- Admittance tunnel measurements

Benefits and Advantages

- Stationary – Quad-ridge tunnel design allows for scans without rotations, enhancing calibration and measurement time
- Proficient – Capable of taking measurements whether at an angle or an anisotropic material
- Multiple ports – Two feeding ports of the antenna can be selected simultaneous or individual based on material application
- Applications – Both near- and far- field

