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Title

A novel broadband coaxial probe to conical wire transition at THz frequency

Source

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Abstract

In this study, transmission characteristics of a novel THz wire waveguide - conical metal wire with dielectric coating at 0.1-1 THz are studied. The investigation results show that the coated conical wire with virtually low attenuation and high energy concentration is a promising candidate as THz transmission medium. The calculation results agree well with that of simulation such as high frequency structure simulation (HFSS), which is based on the finite element method. In this paper, a novel transition from a coaxial line to the coated conical metal wire is designed. Although coaxial probe excitation has been used in microstrip lines and rectangular waveguides in microwave, millimeter-wave frequency domains, the present study shows that it is also an effective method to excite conical wire at THz frequency. As shown in the investigation results, the return loss of coax-conical wire transition is better than 20 dB from 0.1-0.5 THz, and the insertion loss is as low as 1 dB (the total length is 15 mm). It is a promising THz transition structure. (44 References).