

Abstract Submitted
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Microwave Probing of Air-Plasma and Plasma Metamaterials

KATHERINE SCHNEIDER, Naval Research Laboratory, RSI, Inc., University of Michigan, BEN ROCK, MIKE HELLE, Naval Research Laboratory — Plasma metamaterials are of recent interest due to their unique ability to be engineered with specific electromagnetic responses. One potential metamaterial architecture is based on a 'forest' of plasma rods that can be produced using intense laser plasma filaments. In our work, we use a continuous microwave source at 26.5 GHz to measure a single air plasma filament characteristics generated from a 5 mJ laser pulse within a cylindrical hole in a Ka-band waveguide. Preliminary results show the air plasma produces a strong shock and acts to reflect microwave radiation. A computational comparison using 3D EM modeling is performed to examine the reflection and transmission properties of a single plasma rod, and further, to investigate an array of plasma rods as a potential plasma based metamaterial.

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