Abstract Submitted
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Plasma Antenna Shielding ESMAEIL FARSHI, IGOR ALEXEFF, TED ANDERSON, University of Tennessee, Haleakala Research and Development, Inc., UNIVERSITY OF TENNESSEE COLLABORATION, HALEAKALA RESEARCH AND DEVELOPMENT, INC. COLLABORATION — A method and calculation have been developed to protect space based antennas using plasma Frequency selective surfaces radom. The antennas we are trying to protect are currently metal but could be plasma. The scattering process of the electromagnetic waves has been investigated in a plasma antenna tube; this process is of self-important value from the point of view of studying wave propagation and absorption. When electromagnetic waves propagate in media with random inhomogeneities, there appear waves with frequencies and wave vectors which are different from the frequency and wave vector of the fundamental wave. Here, the so-called scattering process occurs. If the medium is spatially homogeneous but parameters defining its electromagnetic properties experience fluctuations, then scattering must occur on these fluctuations, the latter being random inhomogeneities. Induced charges and currents leading to radiating new scattered waves emerge in a medium under the influence of the fundamental wave, thereby initiating the appearance of scattered waves. However, within the linear approximation induced charges and currents in the homogeneous medium represent only the modification of wave propagation characteristics in a medium, as compared to vacuum, i.e., modification of the complex refractive index. The results may be generalized for physical understanding of the scattering process in plasma.

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