Abstract Submitted
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Multiple scattering of radio frequency waves by blobs: homogenization of a mixture of blobs and the Waterman-Truell approach[1] K. HIZANIDIS, F. BAIRAKTARIS, S.I. VALVIS, NTUA, Greece, A.K. RAM, PSFC-MIT — Radio frequency waves are of particular importance for heating and current drive in magnetized fusion plasmas. The scattering of these waves by a multitude of density fluctuations, such as blobs in the edge region, is studied by homogenizing the edge region populated by an ensemble of ellipsoidal plasma blobs immersed in an ambient background plasma. The effective permittivity tensor is formulated on the basis of a depolarization dyadic. In general, the interface between the homogenized slab and the ambient plasma is not necessarily aligned with the magnetic field line. The misalignment leads to changes in the propagation characteristics of the RF waves. The scattering of an incident wave is treated by considering the reflection and transmission through a composite plasma slab. This study is a generalization of [1]; it applies to RF waves in plasmas interacting with ellipsoidal blobs of arbitrary shapes and sizes.

[1] Ari Sihvola, Homogenization of a dielectric mixture with anisotropic spheres in anisotropic background, Lund Institute of Technology, Sweden (1996).

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