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Effects of lower hybrid waves on temperature gradient driven drift-modes in tokamaks: Momentum and impurity transport SALIL DAS, Prince Georges Community College, Maryland, USA, HOGUN JHANG, RAGHVENDRA SINGH, WCI Center for Fusion Theory, National Fusion Research Institute (NFRI), 305-333, Daejon, Korea, HANS NORDMAN, Department of Earth and Space Sciences, Chalmers University of Technology, Gotebörg-412 96, Sweden
— An important goal in tokamak fusion research is the evaluation of the effects of intrinsic rotation on transport barrier formation, determination of momentum pinch velocity and its theoretical basis, and, the significant effect of impurities on tokamak performance by their contribution to radiation losses and plasma dilution resulting in lower fusion power. We use the four-wave parametric process to study these effects invoking a fluid model for ion-temperature-gradient and trapped-electron mode driven turbulence[1] in the presence of radio frequency fields in the lower hybrid (LH) range of frequencies. Explicit expressions for the non-linear growth rate and the associated ion thermal conductivity and effective impurity diffusivity are derived. Parametric coupling of the pump and the sidebands exert a ponderomotive force on electrons, modifying the eigenfrequency of the drift waves and influencing the growth rates and the turbulent transport properties. The effects of the rf fields on the momentum and impurity transport coefficients are evaluated for key parameters like rf power, temperature gradients, and magnetic shear.

[1]Turbulent Particle transport in Magnetized Plasmas: Garbet et al, PRL, 91, 3, 2003

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