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Energetic Impurity Transport in Multispecies Gyrokinetic Plasmas[1] C. ESTRADA-MILA, University of California-San Diego, J. CANDY, R.E. WALTZ, General Atomics — We summarize a systematic study of the behavior of energetic impurities using the GYRO code [1]. Historically, the focus in this area has been on wave-particle interaction of energetic ions (beam ions or alpha particles) with global MHD modes (Alfven eigenmodes or fishbones), with little or no discussion of effects arising from bulk plasma turbulence. Experimental results [2] and theoretical analyses tend to support a view where the interaction between energetic ions and a turbulent background is relatively unimportant. This is expected since at high energies particles have a large orbit width that, crudely speaking, averages over the turbulent transport coefficients. To understand this transition, we study the nonlinear gyrokinetic dynamics of (hot) helium ash as a function of the temperature ratio T_{He}/T_D in the range 1 to 100. Preliminary results indicate that helium confinement improves as T_{He}/T_D increases.

[1] J. Candy and R.E. Waltz, J. Comput. Phys. **186**, 545 (2003).
[2] S.J. Zweben, et al., Nucl. Fusion **40**, 91 (2000).

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