Evolution of Multiple Ion Tails in ICRF Heating*

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An important problem for ITER [1], as well as present day tokamaks [2], is the creation and evolution of energetic particle populations due to wave heating, neutral beam injection, and fusion reactions. These energetic populations, or "ion tails" can significantly alter wave propagation and absorption in the ion cyclotron range of frequencies (ICRF). In some cases, more than one non-Maxwellian ion distribution can exist in the plasma at the same time. Previous self-consistent full-wave and Fokker-Planck calculations of ICRF heating using AORSA and CQL3D [3] have included only one such non-thermal ion distribution. In this work, these calculations are generalized to include multiple ion tails. To simplify the problem, it is assumed that, because of their low densities, the individual ion tails do not interact with each other in the Fokker-Planck solution. They do, however, interact self-consistently in the full-wave solution. Preliminary results will be presented for DIII-D [2] and ITER [1].

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