MODELING IRON PLASMA IN NON-LOCAL THERMODYNAMIC EQUILIBRIUM USING THE FLEXIBLE ATOMIC CODE DATA

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We present a new code, RCF ("Radiative–Collisional code based on FAC"), which is used to simulate steady-state plasmas under non-local thermodynamic equilibrium condition, especially photoinization-dominated plasmas. The Flexible Atomic Code (FAC) supplies all the atomic data needed for RCF, which insures calculating completeness and consistency of atomic data. With four input parameters relating to the radiation source and target plasma, RCF calculates the population of levels and charge states, as well as potential emission spectrum. In preliminary application, RCF successfully reproduces the results of a photoionization experiment at Sandia National Laboratory Z-facility. The effects of the most important atomic processes on the charge state distribution are also discussed.

[1] Bo Han, Feilu Wang, David Salzmann, and Gang Zhao. PASJ 67, 29 (2015).
[2] M. E. Foord et al. PRL, 93, 055002 (2004).