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Development of a Non-LTE model for Z-pinch simulations NICOLAS NIASSE, JEREMY CHITTENDEN, Imperial College — Predicting the energetic and spectral characteristics of Z-pinch sources is a delicate task. It requires solving the Atomic Physics equations for plasmas in a wide range of conditions. In addition, the increasing optical depth of the plasma at stagnation can have a strong influence on its own dynamics, suggesting that simultaneous solution of both the magneto-hydrodynamic and radiative response is required. This constraint places a special emphasis on code optimization. We introduce a simple atomic model that can be run inline with the three dimensional resistive Eulerian MHD code GORGON developed at Imperial College. Based on a Screened-Hydrogenic Model (SHM) with nl splitting and making use of an inexpensive modification of the SAHA equation, this code has demonstrated a good ability to mimic Non-LTE plasma conditions. Preliminary results obtained with the standalone version of the model have shown good agreement with commercial packages (PrismSpect). Comparisons of predictions produced by the inline version with data from High Energy Density Plasma Physics (HEDP) experiments at Imperial College, Sandia National Laboratory and Centre d'Etudes de Gramat are presented. Synthetic Z-pinch XUV images and time dependant spectra are produced.

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