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CCFLY: Modelling the Collisional-Radiative Evolution of a Plasma Driven by an X-Ray Free-Electron Laser[1] SHENYUAN REN, YUANFENG SHI, QUINCY VAN DEN BERG, MUHAMMAD KASIM, JUSTIN WARK, SAM VINKO, University of Oxford, ELISA FERNANDEZ-TELLO, PEDRO VELARDE, Universidad Politecnica de Madrid, HYUN-KYUNG CHUNG, National Fusion Research Institute,Korea — When a solid-density target is isochorically heated by an X-ray Free Electron Laser (XFEL), some portion of the electron energy distribution is highly nonthermal, both during and immediately after the pulse. We have adapted CCFLY, a collisional-radiative code based on the physics of SCFLY[2], to model the collisional and radiative interactions between electrons, ions and photons in the system, taking into account the full electron energy distribution function. We present the results of checks on the code that ensure that the non-thermal terms are consistent with the previous purely thermal CCFLY model, as well as presenting initial analyses of the non-thermal nature of the ion charge state populations, electron distribution functions, and the radiative properties of the system in the presence of the intense FEL irradiation.

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[2]H.-K. Chung, M. Chen, B.I. Cho, O. Ciricosta, S.M. Vinko, J.S. Wark and R.W. Lee. APIP Conference Proceedings **1811**, 020001 (2017).

Shenyuan Ren
University of Oxford

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