

Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Reduction of collisional-radiative models for laser-produced argon plasmas¹ RICHARD JUNE ABRANTES, ANN KARAGOZIAN, HAI LE, Univ of California - Los Angeles — The formation of a laser-induced plasma involves a variety of physical phenomena stemming from the laser-plasma interaction. A thorough understanding of these processes encourages improvement and innovation for many applications. In this work, we aim to computationally reduce a previously-developed collisional-radiative (CR) model constructed from the LANL database², which includes all of the relevant collisional and radiative processes for all the ionic stages of argon. The laser is coupled to the plasma via multiphoton ionization and inverse Bremsstrahlung, processes important for electron production and heating. The use of the CR model allows us to identify dominant mechanisms responsible for initial breakdown of the gas and thermal equilibration processes. The results are compared with experimental data from laser-induced breakdown experiments³.

¹Research supported by the AFOSR

²Argon Atomic Data Sets. <https://www-amdis.iaea.org/LANL/argon/>

³Sircar et al. *Appl. Phys. B* 63, 623-627 (1996).

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Date submitted: 15 Jul 2016

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