

Abstract Submitted  
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**Numerical study of photoionization of nitrogen by molecular and atomic helium emission**<sup>1</sup> ANDREW FIERRO, CHRIS MOORE, MATTHEW HOPKINS, ED BARNAT, PAUL CLEM, Sandia National Laboratories, SANDIA NATIONAL LABORATORIES TEAM — This work investigates the role that molecular and atomic helium emission play on the photoionization process of molecular nitrogen. Both molecular and atomic helium emit radiation in the vacuum ultraviolet (VUV) regime ( $\lambda < 100$  nm). When a plasma is formed in a helium and nitrogen mixture, there exists the possibility for photoionization. However, the atomic helium emission in this regime is radiation trapped and the molecular emission is emitted on longer timescales as compared to the atomic emission. As such, it is currently unclear if atomic or molecular helium emission dominate the photoionization process of nitrogen. Using a particle-in-cell (PIC), Direct Simulation Monte Carlo (DSMC) code, the role of atomic and molecular emission is investigated to elucidate the dominant mechanism for photoionization in a 500 torr nitrogen/helium plasma.

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Andrew Fierro  
Sandia National Laboratories

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