

Abstract Submitted  
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**Particle-in-Cell Modeling of Laser Thomson Scattering in Low-Density Plasmas at Elevated Laser Intensities**<sup>1</sup> ANDREW POWIS, MIKHAIL SHNEIDER, Princeton University — Incoherent Thomson scattering is a non-intrusive technique commonly used for measuring local plasma density. Within low-density, low-temperature plasma's and for sufficient laser intensity, the laser may perturb the local electron density via the ponderomotive force, causing the diagnostic to become intrusive and leading to erroneous results. This effect is explored both theoretically and numerically via kinetic simulations of a quasi-neutral plasma. Results demonstrate that experimentalists should take care when attempting to apply laser Thomson scattering to the measurement of low density plasmas, and where possible avoid boosting the signal by increasing laser intensity. Shneider, Mikhail N. "Ponderomotive perturbations of low density low-temperature plasma under laser Thomson scattering diagnostics." *Physics of Plasmas* 24.10 (2017): 100701. Powis, Andrew T., and Mikhail N. Shneider. "Particle-in-cell modeling of laser Thomson scattering in low-density plasmas at elevated laser intensities." *Physics of Plasmas* 25.5 (2018): 053513.

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