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Modeling Laser-induced Fluorescence Measurements of Plasma Ion Temperature and Mean-field Waves using a Lagrangian Approach FENG CHU, FRED SKIFF, University of Iowa — Laser-induced fluorescence (LIF) is a nonintrusive diagnostic technique that has found applications in the study of a wide range of fundamental and applied problems. Thus it is important to make a correct interpretation of LIF signals. We adopt a Lagrangian approach to compute LIF signals by introducing a non-linear conditional probability function P(x,v,t;x',v',t'). These simulations show agreement with experimental measurements of the ion velocity distribution function (IVDF) as conditions are altered such as laser intensity, collision rate, metastable state quench rate, and collisional excitation rate. In addition, with the presence of mean-field waves, we investigate the dependence of LIF signals on wave frequency and quench rate.

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