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Comparison of established and novel laser-induced fluorescence schemes for Ar I[1] ZACHARY SHORT, M. UMAIR SIDDIQUI, MIGUEL HENRIQUEZ, JOHN MCKEE, JULIANNE MCILVAIN, EARL SCIME, AMY KEESEE, DREW ELLIOTT, West Virginia University — To explore ion-neutral coupling in plasmas, it is advantageous to be able to measure the velocity distribution function (VDF) of ions and neutrals simultaneously at a single spatial location. While in previous experiments we have successfully performed neutral and ion VDF measurements with a single laser, the Ar I neutral laser induced fluorescence (LIF) scheme used was limited to operational regimes that were unsuitable for LIF measurements of Ar II. Here we describe a novel infrared LIF scheme for Ar I using a Sacher tunable diode laser and compare it to the previous Ar I LIF scheme [*Keesee et al.* Rev. Sci. Instrum. **75**, 4091 (2004)]. In contrast to the previous method, our LIF scheme directly pumps a metastable Ar I state which is expected to be well populated for a wide range of plasma source operating parameters. In addition, we present iodine cell spectra for the infrared Ar I LIF scheme and corrected iodine cell spectra for the previous Ar I LIF scheme.

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Zachary Short
West Virginia University

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