Abstract Submitted
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Measuring magnetic fields using laser induced fluorescence of argon neutrals[1] TYLER GILBERT, KATEY STEVENSON, THOMAS STEINBERGER, EARL SCIME, West Virginia University — Faraday rotation and Zeeman splitting have both been used to measure magnetic fields in laboratory and astrophysical plasmas. In reconnecting laboratory plasmas, arrays of probes have typically been used to measure the evolution of the magnetic field topology. An optical diagnostic capable of generating images of the magnetic field topology would provide a non-perturbative technique for measuring the evolution of the magnetic field during magnetic reconnection. Here we present proof-of-principal magnetic field measurements from a diode laser-based laser induced fluorescence diagnostic. The measured Zeeman splitting of σ peaks in neutral argon is the basis of the measurement approach. The particular transition selected is very sensitive to the local magnetic field strength ..()()()..[*Thompson et al.*, 2018]. A Toptica single mode laser is fiber coupled to the PHAse Space MApping experiment (PHASMA) for Ar I measurements in helicon source generated plasmas. The target sensitivity for the diagnostic is magnetic field changes less than 10 Gauss across a sheet laser beam.
1. D.S. Thompson, T.E. Steinberger, A.M. Keesee, & E.E. Scime, "Laser induced fluorescence of Ar-I metastables in the presence of a magnetic field," *Plasma Sources Science and Technology*, **27**, 065007 (2018)

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