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10.13 Laser-induced fluorescence diagnostic of Ion Temperature and Density profile imaging via Pulse lasers in an oxide coated cathode argon plasma

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An oxide coated cathode discharge has been characterized using laser-induced fluorescence (LIF) and Planar LIF. The ion temperature was measured in the center of an argon discharge by LIF diagnosis, and the ion density profiles was measured by PLIF diagnosis. Same Laser system consisting of a pumping pulse laser and a tunable dye laser was used in these two measurements. The absorption spectra measurements of a heated iodine cell are used to monitor the relative wavelength of the laser during the LIF measurement. The ion temperature was found to be about 0.5eV, which was close to the result of gridded electrostatic energy analyzers. The ion density profiles measured by PLIF and the electron density profiles measured by probes have similar structures, and PLIF offers higher spatial and temporal resolutions.

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