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Spectroscopic Studies of Laser Produced Plasma Metasurfaces[1]
ROBERTO COLON QUINONES, THOMAS UNDERWOOD, MARK CAPPELLI, Stanford University — In this presentation, we describe the spatial and temporal plasma characteristics of the dense plasma kernels that are used to construct a laser produced plasma metasurface (PM) that is intended to serve as a tunable THz reflector. The PM is an n x n array of plasmas generated by focusing the light from a 2 J/p Q-switched Nd:YAG laser through a multi-lens array (MLA) and into a gas of varying pressure. A gated CCD camera coupled to a high-resolution spectrometer is used to obtain chord-averaged Hα broadening data for the cross section of a single plasma element at the lens focal point. The data is then Abel inverted to derive the radial plasma density distribution. Measurements are repeated for a range of pressures, laser energies, and lens f-number, with a time resolution of 100 ns and a gate width of 20 ns. Results are presented for the variation of plasma density and size over these different conditions.

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