

Abstract Submitted
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Millimeter-wave to middle ultraviolet radiometry and phase contrast imaging for studies of power balance in COBRA gas puff pinch plasmas^{*1} THOMAS SCHMIDT, MARK GILMORE, SALVADOR PORTILLO, EDL SCHAMILOGLU, University of New Mexico, COBRA COLLABORATION — Radiometer diagnostics from millimeter-wave to near-infrared and middle ultraviolet bands along with a phase contrast imaging diagnostic are being developed in order to characterize radiated power and turbulent density fluctuations in gas puff plasmas in the COBRA high energy density science facility at Cornell University. An initial millimeter-wave radiometer channel will operate in the 94 GHz range, with three near-infrared channels operating at 1100, 1310, and 1550 nm, and a UV channel at 214 nm. The multiple channels in the IR and UV range along with an envisioned expansion of the millimeter-wave radiometer to a number of channels covering the 10-300 GHz range will allow for a detailed characterization of emission as a function of frequency across the UV, IR, and microwave band. The phase contrast imaging system will operate at 1052 nm in the Bragg scattering limit, where small scattering angles corresponding to density fluctuation wavelengths ranging from 1 to 0.1 mm can be resolved spatially and temporally in order to characterize the evolution of the density fluctuation energy spectrum. Diagnostic system design, acquired data, and an explanation of the results will be presented.

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