

Abstract Submitted  
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**Characterization of long-scale-length plasmas produced from plastic foam targets for laser plasma instability (LPI) research**<sup>1</sup> JAECHUL OH, J. L. WEAVER, V. SERLIN, S. P. OBENSCHAIN, Plasma Physics Division, Naval Research Laboratory, Washington, DC — We report on an experimental effort to produce plasmas with long scale lengths for the study of parametric instabilities, such as two plasmon decay (TPD) and stimulated Raman scattering (SRS), under conditions relevant to fusion plasma. In the current experiment, plasmas are formed from low density (10-100 mg/cc) CH foam targets irradiated by Nike krypton fluoride laser pulses ( $\lambda = 248$  nm, 1 nsec FWHM) with energies up to 1 kJ. This experiment is conducted with two primary diagnostics: the grid image refractometer (Nike-GIR)<sup>a</sup> to measure electron density and temperature profiles of the coronas, and time-resolved spectrometers with absolute intensity calibration to examine scattered light features of TPD or SRS. Nike-GIR was recently upgraded with a 5<sup>th</sup> harmonic probe laser ( $\lambda = 213$  nm) to access plasma regions near quarter critical density of 248 nm light ( $4.5 \times 10^{21}$  cm<sup>-3</sup>). The results will be discussed with data obtained from 120  $\mu$ m scale-length<sup>a</sup> plasmas created on solid CH targets in previous LPI experiments at Nike. <sup>a</sup> J. Oh, et al, Rev. Sci. Instrum. 86, 083051 (2015).

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