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Category Number and Subject:

☐ Theory      ☒ Experiment

**Dust Production by Impulsive ELM Heating During Plasma Discharges at DIII-D,\*** B.D. Bray, W.P. West, *General Atomics*, D.L. Rudakov, *UCSD* – Small ( $\sim 100$  nm radius) dust particles (mean density  $4000 \text{ m}^{-3}$ ) are observed in the scrape off layer (SOL) by laser scattering during plasma discharges at DIII-D. The dust detection rate is too low to study dust density evolution in individual discharges, but statistical studies of these particles show significant differences in the dust densities for different plasma configurations. There is a significant increase in dust density during ELMy H-mode discharges relative to other discharges. The dust levels are one half to one third as large during L-mode and ELM-free H-mode discharges. The dust density in ELMy H-mode discharges is sensitive to the pedestal temperature and ELM frequency and can increase as much as a factor of two with pedestal temperature for similar pedestal pressure and injected power. The dust density is also observed to decrease during inter-ELM periods. These measurements suggest the particles are created by impulsive heating from ELMs and the dust density is relatively insensitive to the total heat flux to the wall.

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