Abstract Submitted
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Fast-ion induced ablation of Li granules in DIII-D[1] A. BORTOLON, G.J. KRAMER, R. MAINGI, D.K. MANSFIELD, A. NAGY, A.L. ROQUEMORE, R. LUNSFORD, PPPL, P.B. PARKS, General Atomics, I. BYKOV, R.A. MOYER, UCSD — In DIII-D, sub-millimeter Li spheres are injected at <120 m/s to pace edge localized modes[2]. Typically, granule ablation, monitored by fast visible imaging, begins at the last closed flux surface (LCFS), with strong field-aligned emission from Li^{1+}. During counter I_p neutral beam (NB) injection, non-field-aligned Li emission was observed from the vacuum region between the LCFS and wall, suggestive of a neutral cloud evaporating from the granules. This is ascribed to a relatively high density of fast-ions arising from 80kV counter-I_p NB injection. Simulations with the full-orbit Monte-Carlo code SPIRAL[3] find fast-ion densities up to $1x10^{16}m^{-3}$ with expected heat flux ∼50-100 W/cm^2 at the granule surface, sufficient to induce melting. The non-isotropic fast-ion pressure may cause droplets to leave the melted layer accelerating along characteristic trajectories, a phenomenon observed during injections at <50 m/s.

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[2] A. Bortolon, NF 2016, 056008
[3] G.J. Kramer, PPCF 2013, 025013

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