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Prompt triggering of edge localized modes through lithium granule injection on EAST ROBERT LUNSFORD, PPPL, Z SUN, J.S. HU, W. XU, G.Z. ZUO, X.Z. GONG, B.N. WAN, J.G. LI, M. HUANG, ASIPP, R. MAINGI, A DIALLO, PPPL, K TRITZ, JHU, AND THE EAST TEAM — We report successful triggering of edge localized mode (ELMs) in EAST with Lithium (Li) micropellets, and the observed dependence of ELM triggering efficiency on granule size. ELM control is essential for successful ITER operation throughout the entire campaign, relying on magnetic perturbations for ELM suppression and ELM frequency enhancement via pellet injection. To separate the task of fueling from ELM pacing, we initiate the prompt generation of ELMs via impurity granule injection. Lithium granules ranging in size from 200 - 1000 microns are mechanically injected into upper-single null EAST long pulse H-mode discharges. The injections are monitored for their effect on high Z impurity accumulation and to assess the pressure perturbation required for reliable ELM triggering. We have determined that granules of diameter larger than 600 microns (corresponding to 5.2×10^{18} Li atoms) are successful at triggering ELMs more than 90% of the time. The triggering efficiency drops precipitously to less than 40% as the granule size is reduced to 400 microns (1.5×10^{18} Li atoms), indicating a triggering threshold has been crossed. Using this information an optimal impurity granule size which will regularly trigger a prompt ELM in these EAST discharges is determined. Coupling these results with alternate discharge scenarios on EAST and similar experiments performed on DIII-D provides the possibility of extrapolation to future devices.

Robert Lunsford
PPPL

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