



Gas puff induced runaway electron bursts in ADITYA-U tokamak

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In the first phase of operation of recently upgraded ADITYA-Upgrade tokamak [1], runaway electron (RE) generation and losses due to hydrogen gas puffs in different plasma discharge conditions has been studied over a number of discharges. Hydrogen gas puffs of various magnitudes and time delay have been applied to study their effect on runaway electrons. Multiple bursts in hard X-ray (HXR) emission associated with gas puffs have been observed in plasma current flat top of several discharges. The observation of HXR burst seems to depend upon the background edge plasma as well as the RE density prior to the gas puffs. Further investigation reveals that multiple gas puffs modulate the mode frequency of $m = 3$, $n = 1$ MHD mode present in the edge. This modulation in MHD modes in turn enhances the loss of runaway electrons leading to the observed HXR bursts.

References:

- [1] Ghosh J. et al 2016 Upgradation of ADITYA tokamak with limiter configuration to ADITYA upgrade tokamak with divertor configuration 2016 IAEA Fusion Energy Conf. (Kyoto), 17-22 October, 2016 (FIP/P4-46) Nucl. Fusion submitted. Pre-print: <https://nucleus.iaea.org/sites/fusionportal/Shared%20Documents/FEC%202016/fec2016-preprints/preprint0720.pdf>