Investigation of Temporal Evolution of Hard X-Ray Spectrum from Neon-Seeded Plasma of ADITYA-U Tokamak

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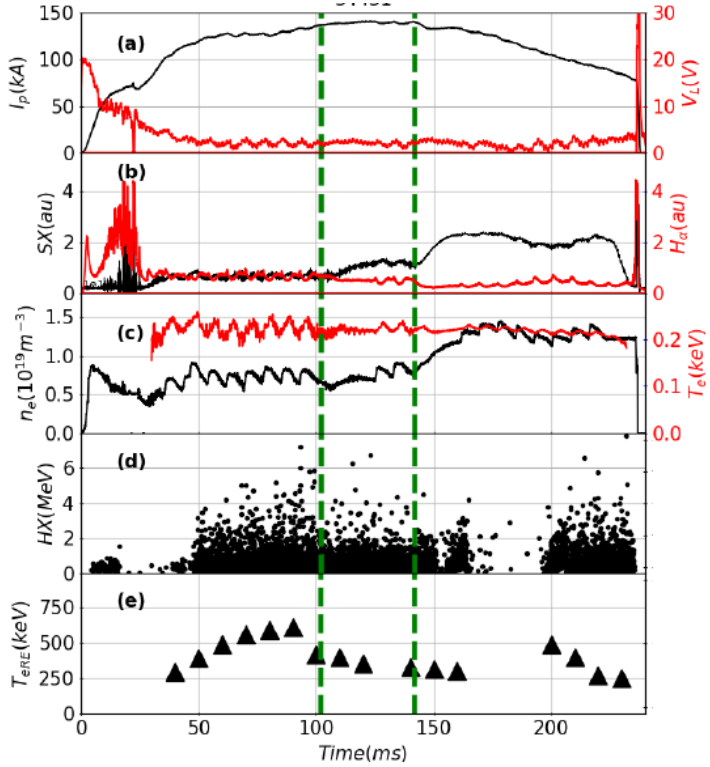

Runaway electrons (RE) offer a substantial threat to any tokamak plasma due to the energy they carry. Any excursion of the RE electrons to the Plasma facing components (PFC) will be a serious threat to the tokamak as melting or material sputtering is highly anticipated. Therefore temporal monitoring of the RE in terms of flux/population and energy space is required for a high-performance fusion grade plasma. The role of RE and its possible mitigation via Neon seeding is studied passively by measuring Hard X-ray (HX) emissions generated by RE mostly in terms of total counts integrated over, all the energies.

The addition of the neutral atoms of the neon gas in to the ADITYA-U tokamak plasma shows the decrease in the runaway electron energy and qualitatively suggest increase in the overall thermal content of the plasma.

The temporal evolution of (a) plasma current (I_p) and loop voltage (V_L), (b) soft X-ray (SX) and neutral hydrogen emission (H_α), (c) electron density (n_e) and temperature (T_e), (d) Hard X-ray (HX) and (e) average RE temperature (T_{eRE}) for an ADITYA-U discharge.

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