

Finding of Bremsstrahlung radiation asymmetry in Aditya-U tokamak

Abstract

The well-known phenomena of radiation by the decelerated charged particles, i.e., Bremsstrahlung radiation is observed in case of tokamak plasma. Especially, the core of the plasma at which the density (n_e) and temperature (T_e) reach to their maxima, is the potential source of such Bremsstrahlung radiation. The range of such radiation falls into the X-ray region, which is approximately in between 0.1 to 20 keV. The power of radiated soft X-ray (SXR) is strongly dependent on several plasma parameters, including the impurity concentration (Z_{eff}), n_e , T_e etc. Hence, the radiated soft X-ray carries several information about the basic parameters (Z_{eff} , n_e , T_e etc.) of radiating source plasma.

Aditya-U is presently having a SXR system working and it measures the soft X-ray radiation from the plasma at some particular toroidal location. Thus, all the outcomes are interpreted as toroidally symmetric and the corresponding plasma parameters are assumed to hold at any other toroidal location. In this project, we will experimentally measure the SXR radiation at a different toroidal location and address the toroidal asymmetries in radiation, if any, present for the Ohmic discharges in Aditya-U tokamak plasma. This study will further be extended in case of plasma at different experimental conditions.

Academic Project Requirements:

1) Required No. of student(s) for academic project: 1

2) Name of course with branch/discipline: B.Sc. Physics

3) Academic Project duration:

(a) Total academic project duration: 26 Weeks

(b) Student's presence at IPR for academic project work: 2 Full working Days per week

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