

Seminar

Institute for Plasma Research

Title : Effect of magnetic field on the lateral interaction of plasma plumes

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Date : 16th March 2020 (Monday)

Time : 03.00 PM

Venue : Seminar Hall, IPR

Abstract :

Collision of plasma plumes is an important phenomenon in many laboratory plasma and applications such as plasma confinement, inertial confinement fusion (ICF), laboratory studies of plasma of astrophysical importance, generation of nano-particles and ion-sources etc. In the present study, lateral interaction between two plasma plumes in the presence of an external magnetic field has been investigated. A Helmholtz coil has been used to produce the variable magnetic field ranging from 0 - 0.6 T. An Nd:YAG laser (8 ns at FWHM) is used to produce the plasma plumes at the centre of Helmholtz coil. Characteristic behaviour of both seed plumes and interaction region in the presence of field are compared with those for field free case. Interestingly no sharp interaction zone is observed as it usually arises in the field free case in colliding plasma. A significant enhancement in emission intensities, specially Al^{2+} , in both seed as well as interaction regions of the colliding plasma plumes is observed in the presence of magnetic field which is in sharp contrast to field free case where neutral emission dominates at longer times. The observed results are interpreted quantitatively by estimating the abundance of charge state and ionization rate coefficient for both the cases.
