Seminar

Institute for Plasma Research

Title : Study of colliding plasmas dynamics and stagnation layer parameters for applications in analytical techniques (LA-ICP-MS)

Speaker: Dr. Pramod Pandey
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Date : 23rd December 2020 (Wednesday)

Time : 03.30 PM

Venue : Online - Join the talk: https://meet.ipr.res.in/Dr.PramodPandey_PDFTalk

Abstract :

Laser produced plasmas are well studied for their uses in technological and research applications. 1, 2 They also underpin analytical techniques such as laser induced breakdown spectroscopy (LIBS)3 and laser ablation inductively coupled plasma mass spectroscopy (LA-ICP-MS)4 where LIBS can provide limit of detection values down to parts per million (ppm)5 and LA-ICP-MS even better values. In the latter, the laser ablates the sample (atomization step) and the material produced is transported to the ICP torch. It has been found that the formation of nanoparticles in this atomization steps improves significantly the limit of detection, down to parts per billion (ppb), 6 but cost and complexity of the system also enhanced, since this is usually achieved by using an expensive ultrafast laser system in place of a cheaper and simpler Q-switched system. However the formation of nanoparticles in colliding (nanosecond) laser plasmas 6 in gaseous atmospheres could lead to a significant simplification over femtosecond laser produced plasmas and hence the reduction of the cost. Also the colliding plasma technique can be useful in nanocomposite deposition with controlled stoichiometry.7 The presentation will cover on the study of the colliding plasmas dynamics and formation of the stagnation layer in different ambient atmosphere followed by the study of the plasma parameters for the possible use of stagnation layer in technological applications.

References

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