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Seminar

Institute for Plasma Research

Title : Characterization of Laser Induced Plasma in Air using Time and Space Resolved LIBS

Speaker: Dr. Eshita Mal
Indian Institute of Technology, Guwahati

Date : 08th September 2020 (Tuesday)

Time : 03:30 PM

Venue : Online - Join the talk:

https://meet.ipr.res.in/Dr.EshitaMal_PDFtalk

Abstract :

Laser Induced Breakdown Spectroscopy (LIBS) is an optical emission based technique used for qualitative and quantitative analysis for any sample. It is free from any sample preparation, applicable to any sample regardless of its physical states, the flexibility in experimental set up and as only optical access is needed to material under investigation and the plasma emission from the material, this technique is suitable for both in-situ and ex-situ analysis. In the present thesis work, time and space resolved LIBS are employed to study tungsten, molybdenum and three different alloys of copper. The plasma temperature estimated via Boltzmann plot method and stark-broadened line is used to estimate the electron density. The local thermodynamic equilibrium (LTE) and optical thin of plasma condition is verified in the present study. From the time and space resolved studies, an optimized time and space window are obtained where the LTE and optical thin condition of plasma are valid along with high signal to noise ratio in laser induced plasma. Single line CF-LIBS technique is applied on copper alloys to estimate the composition of the constituent with higher accuracy. The laser ablated sample surface is characterized using optical microscope, surface profilometer, FESEM and Raman analysis and these studies are correlated with the estimated laser parameters estimated in the LIBS study
