

Seminar

Institute for Plasma Research

- Title :** Erosion, Re-deposition & Neutron Damage:
Recent Investigations in Plasma-Material
Interactions
- Speaker :** Dr. P.N. Maya
ITER-India, Institute for Plasma Research,
- Date :** 26th October 2017 (Thursday)
- Time :** 03.30 PM
- Venue :** Seminar Hall, IPR

Abstract :

Plasma-Material Interactions (PMI) are unavoidable in any laboratory plasma where ions, electrons, neutrals/radicals and heat from the plasma interact with the material walls which makes it interesting in terms of fundamental studies as well as plasma applications. Plasma can erode materials and some of the plasma species can get deposited on the wall as well. In nuclear fusion devices, the interplay among these processes along with plasma transport can lead to the accumulation of fuel isotopes (H/D/T) in the wall material which can affect the tokamak operation from hydrogen recycling and subsequent plasma stability and also the licensing of the reactor due to safety concerns arising from the radioactivity of tritium. In fusion reactors, the 14.1 MeV neutrons and 3.5 MeV alpha particles cause transmutation of the wall material as well as radiation damage which can alter their thermal, mechanical as well as hydrogen trapping properties.

These processes take place at disparate time and space scales which makes them inherently multi-scale in nature. Understanding of such processes requires multi-scale tools which can address individual scales and the link between them starting from atomistic to continuum scales.

I shall discuss some of the studies carried out in the erosion, deposition and neutron damage in carbon and tungsten including surrogate ion irradiation.
