Seminar

Institute for Plasma Research

Title: Quantification of irradiation-induced defects in neutron-irradiated Austenitic Stainless Steels

Speaker: Dr. Shreevalli
Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam

Date: 12th December 2025 (Friday)

Time: 10:30 AM

Venue: Seminar Hall, IPR

Online Link: https://bharatvc.nic.in/join/7958694699

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Abstract

The neutron irradiation-induced effects in Indian variants of fast reactor austenitic stainless steels employed for high-dose core components and for relatively low-dose permanent reactor structures have been studied using synchrotron source based X-rays, to quantify defects and to analyse the difference in the phase formation behaviour. In addition to this, TEM analysis of low *dpa* specimens to study the size-distribution and number density of the irradiation-induced defects, mainly the faulted dislocation loops have been carried out. Finally, a correlation has been established between the XRD and TEM data on defects density. The dislocation density values determined using XRD are approximately 10 times higher than that of number density determined using TEM considering the highest *dpa* sample in each category. Considering high displacement damage wrapper samples, Ferrite and $M_{23}C_6$ are commonly observed. Variation in void size and loop size has been studied and found to be dominantly dependent on irradiation temperature.