Seminar

Institute for Plasma Research

Title : Thermal-Hydraulics and Structure optimization Performance Analysis in a T-Junction of High Temperature Helium Cooling Loop

Speaker: Dr. Sandeep Rimza
Institute for Plasma Research, Gandhinagar

Date : 17th March 2022 (Thursday)

Time : 11.30 AM

Venue : Online - Join the talk:
https://meet.ipr.res.in/PDFextensiontalk_Dr.SandeepRimza
(Best view in “Mozilla Firefox")

Abstract :

High temperature and pressure helium (8 MPa, 300–500°C) experimental helium cooling loop (EHCL) is essential for the cooling of the first wall of blanket concept. The installation of EHCL is in progress at Institute for plasma research (IPR). There is lot of challenges in the design of helium cooling loop and T-junction is one of the imporatant components in the helium cooling system. Helium flow field in T- junction is complicated due to mixing of flows with dissimilar temperature and velocity ratio as a results of that uneven temperature gradient and pressure losses at Tjunction structure. This turbulent mixing results in high amplitude temperature fluctuations i.e. leads to high thermal stresses in inside the pipe structure walls. In cooling system too drastic flow ripple can cause pressure ripple which would break the pipe, so it is significant to control the velocity shock and temeratuure fluctuation in junction. In present study the complicated flow field around mixing junction is investigated. Our objective is to alleviate the flow shock and minimize the pressure loss through the analysis of the flow field and by modifying the structure of T-junction. All the results and outcomes of the invesgation and future work will be presented.