

Seminar

Institute for Plasma Research

Title : Single phase and two phase flow studies under single sided heating condition

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Date : 13th December 2017 (Wednesday)

Time : 11.00 AM

Venue : Committee Room 4, (New Building), IPR

Abstract :

Sub-cooled region is widely encountered phenomenon in industry such as nuclear engineering like PWR and BWR also during start-up condition, mechanical engineering or chemical engineering etc. Sub-cooled region comprises two phase flow followed by single phase flow. In this region, the bulk temperature of fluid is below the saturation temperature. The ITER divertor is subjected to extremely high-heat fluxes of up to 10 MW/m^2 to 20 MW/m^2 . The pressure drop and heat transfer especially Critical Heat Flux (CHF) phenomena in sub-cooled region across divertor test mock-up are important phenomena in view of economics and safety.

The present work describes the assessment of correlations for heat transfer coefficient and pressure drop in single and two phase flow, and CHF under single sided heating conditions. To study, heat transfer especially CHF and pressure drop phenomena, a test mock-up has been fabricated and installed at High Heat Flux facility to perform experiments for subcooled phase region. Experimental test matrix and procedure has been described. Experiments are being currently performed to study heat transfer in single phase region under single sided heating conditions.

In addition, to study void fraction distribution in simulated ITER test mock-up which is important in view of CHF, an air-water experimental facility has been developed. For this, flow regime transition study and scaling has been done. Methodology to measure void fraction has been presented.
