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Estimation of Heat transfer in a channels

Abstract

Heat transfer in First wall and cooling plate of blanket and improvement in heat transfer are major thrust area of this study. Heat transfer coefficient is the major parameter in determining the heat transfer and thus cooling of a blanket. Although there are many correlations available in literature to study the effect of flow parameters on heat transfer coefficient. But to validate them experimentally and numerically gives additional information and confidence in providing design solutions in improving the heat transfer in a blanket at actual operating conditions. The effect of flow parameters, roughness, channel size and shapes, cooling medium will be studied in this experimental study. These experiments will help us in achieving different objectives of testing various components, test mock-ups along with proving sufficient information to validate our heat transfer studies.

The project involves literature review and study of different works done worldwide to estimate heat transfer coefficient in channels. Intensive numerical simulation on ANSYS CFD to validate the studies at different Reynold's number and Nusselt's number in the channel needs to be performed. An attempt to develop a small experiment to validate some the correlations or develop new one is to be made and published. Some ideas or concepts to improve the heat transfer in the channel needs to be developed and demonstrated.

Academic Project Requirements:

- 1) **Required No. of student(s) for academic project:** One
- 2) **Name of course with branch/discipline:** M. Tech. Mechanical
- 3) **Academic Project duration:**
 - (a) **Total academic project duration:** 12 Months
 - (b) **Student's presence at IPR for academic project work:** 3 Full working Days per week

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