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DESIGN OF 70 K THERMAL SHIELD OF A CRYOMODULE FOR BETA 0.61 650 MHZ SCRF CAVITIES

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Content :

Abstract

Design and development of a cryomodule for low beta 0.61, 650 MHz SCRF cavities is underway at Cryomodule Engineering Lab. of Cryo-engineering and Cryomodule Development Division (CCDD) at RRCAT. This cryomodule will be used in superconducting linear accelerator for upcoming Indian Spallation Neutron Source (ISNS) project, envisaged by DAE. This cryomodule will accommodate three numbers of 650 MHz low beta SCRF cavities in a vacuum vessel of diameter 1.2 meter and length of 5 meter. Design for major subsystems has been initiated. 70 K thermal shield is one of the major subsystems of Cryomodule, protecting cavities operating at 2 K from room temperature thermal radiations. This paper discusses design of 70 K thermal shield in detail. This paper also describes FEA results for cool down of 70 K shield with different cooling rates to optimize the design. Thermal and structural analysis of finger weld region of 70 K thermal shield has also been carried out. Based on these studies, design of 70K thermal shield for 650MHz cryomodule has been optimized.

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