DAE-BRNS

Indian Particle Accelerator Conference (InPAC-2022)

March 22-25, 2022
Variable Energy Cyclotron Centre, Kolkata

Book of Abstracts

Radiation Shielding Calculations for the 10 MeV electron linac Injector test facility at VECC

Abstract ID208

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Radioactive Ion Beam Facilities Group of VECC has undertaken an effort to explore photo fission for producing n-rich radioactive ion beams in the ANURIB project, using an electron linac (e-LINAC) as a primary accelerator. The 10 MeV Injector of the e-LINAC comprises electron gun, low energy beam transport (LEBT) line, an injector cryo-module (ICM), beam dump, diagnostics etc. The ICM based on 1.3 GHz superconducting rf technology has been developed in collaboration with TRIUMF Canada. The electron gun and LEBT line has been developed indigenously and installed in a test area set-up at VECC in preparation for testing the ICM. As part of the Radiation Safety Report for the 10 MeV Injector radiation shielding calculations have been carried out using Monte Carlo code FLUKA, so that the regulatory requirements are achieved for its commission tests. The test area is set-up in existing High resolution Cave-1 of size 10 m x 23 m having concrete shielding walls of 1.5 m thick on two sides and 0.8m thick on the other sides. Detailed calculations including optimization of local shielding around the beam dump has been done to obtain ambient dose rate within safety limits. Details of the calculations will be discussed.

Leak Detection and Rectification in Insulating Vacuum of Horizontal Test Stand-2 Cryostat

Abstract ID209

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HTS-2 cryostat has been developed in collaboration with Fermilab USA to test two dressed 650 MHz SCRF cavities in one testing cycle. It has been fabricated in an Indian industry and installed successfully at RRCAT. The lower cryostat part and upper feedcan part make a complete cryostat. HTS-2 cryostat has been operated at its designed temperature of 2K for last two years. During Aug-2021, device showed sign of significant leak 10^{-6} mbar-l/s in LN2 circuit, as insulated vacuum level degraded after flow of liquid nitrogen in cryostat. For tracing and rectification, cryostat lower part and feedcan were separated and tested individually. After two months of continuous efforts, leak was traced in one of the demountable joints of LN2 circuit in lower part of cryostat. Leak was repaired and integral leak rate of the order of $3.6\text{x}10^{-8}$ mbar. l/s was demonstrated at room and at cryogenic temperature of 80K. After resolving the problem, HTS cryostat is currently under operation to test SCRF cavities. The paper describes the systematic approach adopted to detect the leak, repair of leak, post repair reassembly of the cryostat and it's feedcan, and final demonstration of acceptable integral leak rate of complete cryostat. As such