

Gas loads into SIS100 cryogenic vacuum sections

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FAIR is a new, unique international accelerator complex for the research with antiprotons and ions. In cooperation with an international community of countries and scientists it will be built within the coming years near Darmstadt (Germany). With a length of about 1.1km the synchrotron SIS100 is the largest accelerator ring of the complex and represents the core of the facility. The machine is presently in its advanced planning phase at GSI.

Due to the use of fast-ramped superconducting magnets approximately 80% of the whole beam vacuum will be operated at cryogenic temperatures between 5...15K. In these cold sections cryopumping is used to generate UHV/XHV pressures in the beam pipes. After a brief overview on the infrastructure of the cryogenic beam vacuum system we discuss results of analytical calculation based on the Hobson-Welch theory for determining cryogenic pressure profiles in a cold-bore vacuum tube when external H₂ or He loads are to be expected.