

STATUS OF THE SC CW-LINAC DEMONSTRATOR INSTALLATION

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ABSTRACT

The kick-off for the cw Linac Demonstrator project at GSI was aimed at a "full performance" of a 217 MHz sc CH-Cavity at the GSI-High Charge Injector (HLI). Meanwhile the design of the key components like the 217 MHz CH-Cavity, two sc solenoids, and the cryostat itself is finalized and their fabrication has started.

The test environment at GSI is about to be completed, such that the commissioning of the sc cw Linac Demonstrator is planned in 2014, when the key components are expected to be delivered.

CW LINAC DEMONSTRATOR

The concept of a suspended support frame, which carries the cavity embedded by two sc solenoids, is followed [1]. The support frame as well as the accelerator components are suspended by eight tie rods each in a cross-like configuration (nuclotron suspension) balancing the mechanical stress during the cooling-down and warm up (Fig.1). This way the components will always stay within the tolerance limits related to the beam axis (longitudinal +/-2mm, transversal +/-0.2mm). The CH cavity is cooled with LHe directly using a He jacket out of titanium. The delivery is expected in 2014 [2]. The solenoids are connected to LHe pots inside the cryostat by copper tapes allowing dry cooling. The main coil out of NbSn and two compensation coils made from NbTi provides the maximum magnetic field of 9.3 T, and shields within 10 cm to acceptable 30 mT at the position of the neighbored cavity. The delivery is expected in 2014.

SETUP AT GSI HLI

Commissioning of the Demonstrator is planned in 2014 at the GSI HLI, which operates at 108 MHz. A new beam line in straightforward direction to the HLI, which transports the beam to the new radiation protection shelter locating the Demonstrator, was designed regarding beam dynamical simulations. The new beam line with focusing and steering magnets has been installed already as well as beam diagnostic components in front of and behind the Demonstrator. The beam line is equipped with profile grids, beam transformers, and an emittance measurement station. Phase probes are used for output energy measurements applying the time of flight (TOF) method.

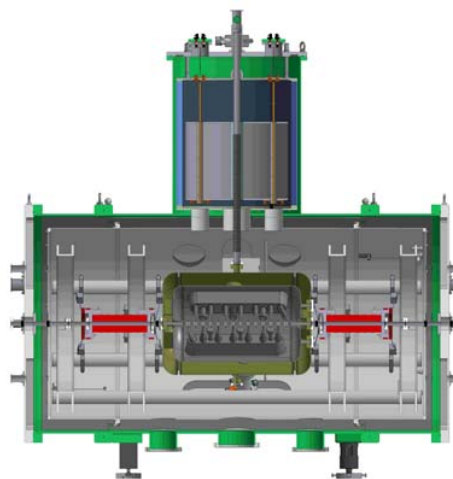


Figure 1: The cw Demonstrator comprising a CH cavity embedded by two solenoids on a support frame.

OUTLOOK AND FUTURE APPLICATIONS

The Demonstrator project is a proof of principle on the CH cavity. Successful full performance tests with beam of the sc CH cavity open a broad field of accelerator applications like the MYRRHA project [3] or the sc sw-LINAC at GSI [4]. Also the extension of the Demonstrator to a string of five CH cavities is proposed (advanced Demonstrator) [5].

References

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