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SUPERCONDUCTING RF ACTIVITIES AT FZ-JUELICH

R. Stassen, H. Singer, F.M. Esser, Forschungszentrum Juelich
R. Eichhorn, TU Darmstadt, Germany

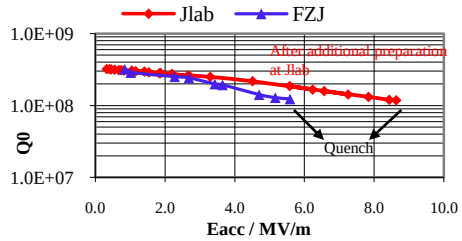
JÜLICH FORSCHUNGSZENTRUM

For many years sc cavities have been designed and tested in Juelich: The 5-cell elliptical prototype cavity for the ESS was measured in a horizontal cryostat. A vertical test cryostat was installed to characterise the Halve Wave Resonators (HWRs) for the COSY linac project and several spoke-type cavities. During the measurements of the 352 MHz triple-spoke cavity (designed and built within the Hippi collaboration) a 2K operation was established using some refurbished pumps from the University of Wuppertal. First experiences with the 2 K operation, sometimes hindered by thermo-acoustic oscillations, and the final results of the 352 MHz spoke-cavity will be presented. Furthermore, we will report on the cryomodule performance, built for the Half Wave Resonators. Currently, one prototype cavity has been completed with a titanium helium cover and installed into the cryostat. The whole system with one cavity is now ready for first RF tests.

Vertical test cryostat

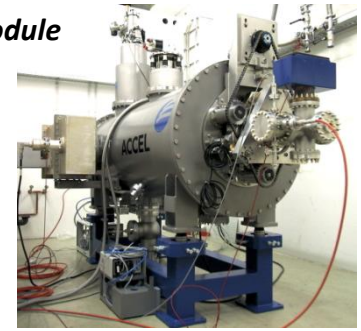
760MHz triple spoke cavities (design E. Zaplatin)

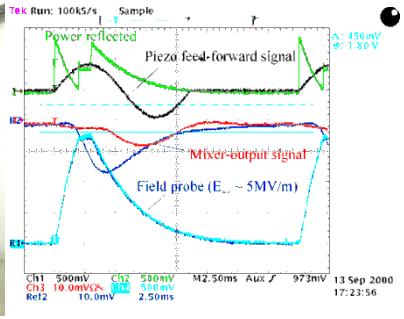
Comparison Jlab – FZJ at 4K



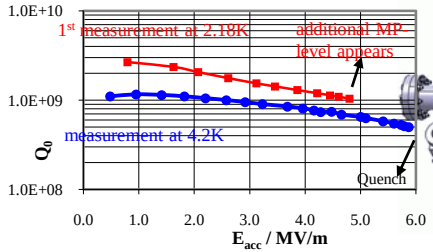
Horizontal ESS test module

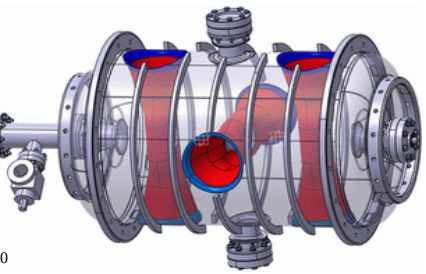
500MHz test-cavity
5-cell elliptical, β=0.75
Cryostat with cryopump
Adjustable power coupler
Frequency tuner:
-3 piezo elements
--motor driven chain
E_{acc} *~ 5MV/m CW and*
E_{acc} *~ 11MV/m pulsed*

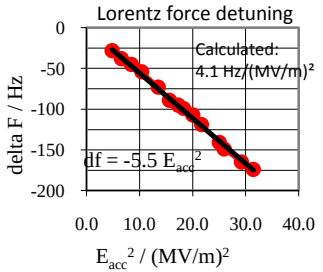




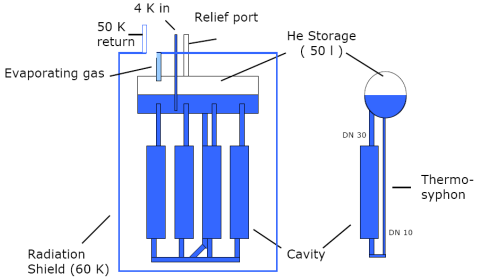
First 2K operation (2.18K limited by long pumping line) with 352MHz HIPPI spoke cavity



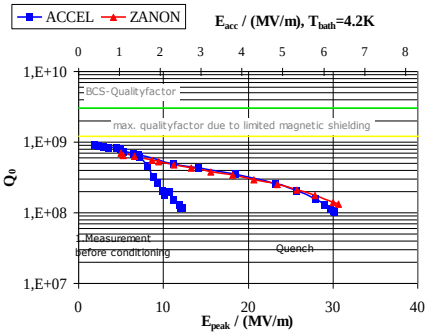




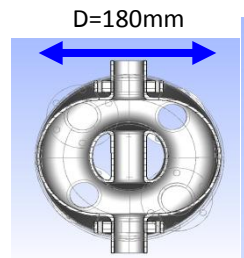
Linac cryostat: LN_2 and cryopump free design
Equipped with one half wave resonator

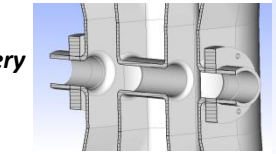


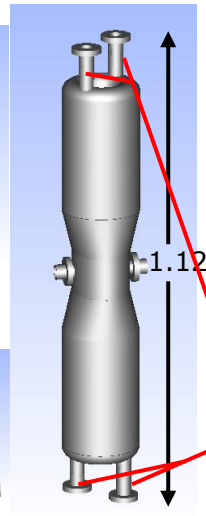
1st cool down successful
LHe level reached within 200min
Static losses: ~1W



Tuning region with very strong multipacting







4 Accessports (chemical preparation, HPR)
Used for couplers and additional pumping