



Contribution ID: 205 Contribution code: THU-PO3-802-05

Type: Poster

## Cryostat for HECRAL Superconducting Magnet

*Thursday, 18 November 2021 10:00 (20 minutes)*

In order to meet the normal operation of HECRAL (Hybrid superconducting Electron Cyclotron Resonance ion source with Advance in Lanzhou) superconducting magnet, a cryostat in the form of immersed in liquid helium was designed, which integrated two two-stage GM cryocoolers, helium tank, thermal shield, outer dewar, suspension structures, maintenance tower, binary current leads, corresponding monitoring and diagnosis system. The 1st cooling head of the two-stage cryocoolers was used to cool the thermal shield, copper leads and HTS (High Temperature Superconducting) current leads; Enough cooling capacity in the temperature region of 4.2K was supplied by the 2nd cooling head to condense the saturated helium vapor evaporated by thermal load (including static thermal load and dynamic thermal load), so as to realize the “0” liquid helium evaporation operation of the superconducting magnet. Corresponding structure and heat transfer of the designed cryostat were analyzed, and the WST(Western Superconducting Technologies Co.) was commissioned to install the cryostat and carried out cryogenic excitation test. The cryostat is now operated in IMP (Institute of Modern Physics, Chinese Academy of Sciences) and all parts of the magnet and cryostat are working normally, which ensures proper operation of the ion source.

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**Session Classification:** THU-PO3-802 Cryostats and Cooling systems