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Cooldown analysis of a cryocooler based quadrupole magnet cryostat

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A superconducting quadrupole doublet magnet cryostat with cold super ferric iron cover for Hybrid Recoil Mass Analyzer (HYRA) beam line has been commissioned. The total cold mass at 4.2K is 2 ton which is mainly contributed by iron yoke and pole. Two stage cryo coolers have been fitted to the cryostat to take care of various heat loads coming to the cryostat. 2nd stage of cryocooler has been used to reliquefy helium gas evaporated form the helium vessel by using a recondenser and the first stage provides cooling necessary to maintain the intermediate shield at ˜55-65 K. HTS current leads have been used to reduce the head load. The 1st successful cooldown of the cryostat has been done recently, magnets have been powered and the magnetic field profiling in the beam tube has been completed. This paper will discuss the important development from the cryogenic view point and preliminary results obtained from the cooldown data.

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