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C3Or1B-04: Design, Fabrication, Commissioning and Testing of FRIB 2 K Cold Compressor System

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The FRIB cryogenic engineering group designed and built the sub-atmospheric cold box which supports the 2 K (31 mbar) operation of the FRIB accelerator cryo-modules. The centrifugal cryogenic (cold) compressors, designed with room temperature motors and active magnetic bearings, were supplied by Air Liquide to FRIB specifications and were integrated into the cold box which was built on site. The preliminary commissioning tests demonstrated that the system has achieved all the specification goals of operating from 110-180 g/s with a suction pressure of 0.028 mbar, discharge pressure of 1.15 bar and a discharge temperature less than 30 K. This paper will briefly review the sub-atmospheric 2 K system design features and discuss the recent commissioning results.

Authors: Dr KNUDSEN, Peter (Facility for Rare Isotope Beams - Michigan State University); Dr GANNI, Venkatarao (Facility for Rare Isotope Beams - Michigan State University); Dr CASAGRANDE, Fabio (Facility for Rare Isotope Beams Michigan State University); FILA, Adam (Facility for Rare Isotope Beams Michigan State University); HASAN, Nusair (Facility for Rare Isotope Beams - Michigan State University); Mr WRIGHT, Mathew (Facility for Rare Isotope Beams Michigan State University); Mr VARGAS, Gerardo (Jacobs Technology-JSC); Mr JOSEPH, Nathan (Facility for Rare Isotope Beams - Michigan State University)

Presenter: Dr KNUDSEN, Peter (Facility for Rare Isotope Beams - Michigan State University)

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