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US-HiLumi Accelerator Upgrade Project Pre-series Cryo-Assembly 01 Production and First Results

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For the Hi-Lumi LHC Upgrade (HL-LHC) new high field and large-aperture quadrupole magnets for the low-beta inner triplets (Q1, Q2, Q3) are being built. These new quadrupole magnets are based on Nb₃Sn superconducting technology. As part of the US-HiLumi Accelerator Upgrade Project (AUP) ten Cryostat Assemblies (LQXFA) for Q1 and Q3 replacement will be built, tested and delivered to CERN. The first of the LQXFA was assembled and prepared for cold testing at Fermi National Accelerator Laboratory (FNAL) during the summer of 2021. We will present the integration work of the Cold Mass assembly into the Cryostat Kit provided by CERN. Each Cold Mass contains two trained MQXFA magnets of ~ 5 m length installed in a stainless-steel helium pressure vessel. The Cold Mass will be surrounded by cryostat shields, piping, and vacuum vessel. We will discuss the metrology survey results and present the LQXFA measurements prior testing at the Fermilab Magnet Test facility.

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