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Assembly and First Test of the US-MDP Nb3Sn Dipole Demonstrator

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U.S. Magnet Development Program (US-MDP) has developed a Nb3Sn dipole demonstrator for a post-LHC pp Collider. The magnet has 60-mm aperture, 4-layer shell-type graded coils, and cold iron yoke. The cable in the two inner layers has 28 strands 1.0 mm in diameter and the cable in the two outer layers has 40 strands 0.7 mm in diameter. Both cables are using RRP Nb3Sn wires produced by Bruker-OST. A mechanical structure is based on aluminum I-clamps and a thick stainless steel skin. The maximum field for this design is limited by 15 T due to mechanical considerations. The first magnet assembly was done with lower coil pre-load to minimize the risk of coil damage during assembly. This presentation describes the details of the magnet design and the assembly procedure. First results of magnet cold tests are presented and discussed.

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