MT 26
International Conference
on Magnet Technology
Vancouver, Canada | 2019

Contribution ID: **1586** Type: **Contributed Oral Presentation**

Wed-Af-Or13-04: Development of REBCO dipole magnets using CORC® wires

Wednesday 25 September 2019 17:15 (15 minutes)

In collaboration with Advanced Conductor Technologies, the U.S. National Magnet Development Program is developing REBCO magnets with a goal of generating 5 T dipole fields. We have built several subscale magnets based on the Canted-Cos-Theta (CCT) concept using commercial REBCO Conductor on Round Core (CORC®) wires. The latest magnet C2 has four layers and a designed dipole field of 3 T in an aperture of 70 mm. It is wound with 80 m long 30-tape CORC® wires based on REBCO tapes with a 30-micron thick substrate produced by SuperPower Inc. The details of magnet fabrication are presented, including the fabrication of metal mandrels and support of conductors with Stycast. We report on the transport current performance and field generation measured at 77 and 4.2 K, and compare to expected values. The C2 CORC® CCT dipole magnet provided an important step towards 20 T hybrid dipole magnets for future circular colliders. The magnet fabrication and performance also provided effective feedback on the optimization of CORC® wires that can in turn improve the magnet performance.

Authors: WANG, Xiaorong (Lawrence Berkeley National Laboratory); ARBELAEZ, Diego (Lawrence Berkeley National Lab); TIMOTHY, Bogdanof (Lawrence Berkeley National Laboratory); BROUWER, Lucas (Lawrence Berkeley National Laboratory); CASPI, Shlomo; DIETDERICH, Daniel (Lawrence Berkeley National Laboratory); GOURLAY, Stephen (LBNL); GARCIA FAJARDO, Laura (Lawrence Berkeley National Laboratory); HIGLEY, Hugh (Lawrence Berkeley National Laboratory); LIPTON, Thomas (Lawrence Berkeley National Laboratory); MARCHEVSKY, Maxim (Lawrence Berkeley National Laboratory); PRESTEMON, Soren (LBNL); Dr SHEN, Tengming (Lawrence Berkeley National Lab); TAYLOR, Jordan (Lawrence Berkeley National Laboratory); TURQUETI, Marcos (Lawrence Berkeley National Laboratory); VAN DER LAAN, Danko (Advanced Conductor Technologies); WEISS, Jeremy (Advanced Conductor Technologies)

Presenter: WANG, Xiaorong (Lawrence Berkeley National Laboratory)

Session Classification: Wed-Af-Or13 - High Field HTS/Hybrid Magnets for Accelerators