



Contribution ID: 711 Contribution code: WED-PO2-111-08

Type: Poster

First canted cosine theta Bi-2212 accelerator magnets: Fabrication, performance, and prospects

Wednesday 17 November 2021 10:30 (20 minutes)

Recent years have seen significant development of high-temperature superconducting Bi-2212 wires and magnets in the US with record critical current density, record wire lengths and record performance model magnets. A dozen racetrack coils have been produced within the LBNL subscale accelerator magnet program using Bi-2212 Rutherford cables, including the record performance of RC6, which carried 8.6 kA and operated safely at a wire engineering current density of 1000 A/mm². In addition, a 4.7 T common coil dipole magnet RC7n8 was made from twisted industrial wires. In this talk, we will examine coil fabrication technology based on a canted-cosine-theta magnet technology with stress management capability for achieving dipole fields greater than 15 T, and present results of prototype dipole magnets including quench characteristics and field quality. Performance will be examined in the larger context of applicability of Bi-2212 for the next generation high energy physics colliders and other applications. We will also discuss the efforts to increase the Bi-2212 coil length to ~1 m long using the overpressure processing heat treatment for the first time.

Primary authors: SHEN, Tengming (Lawrence Berkeley National Lab); GARCIA FAJARDO, Laura (Lawrence Berkeley National Laboratory); HAFALIA, Aurelio (Unknown); ARBELAEZ, Diego; BROUWER, Lucas (Lawrence Berkeley National Laboratory); CASPI, Shlomo; FERRACIN, Paolo; MARCHEVSKY, Maxim; MYERS, Cory (Lawrence Berkeley National Lab); PONG, Ian (LBNL); PRESTEMON, Soren; TEYBER, Reed (Lawrence Berkeley National Laboratory); RUDEIROS FERNANDEZ, Jose Luis; WANG, Xiaorong (Lawrence Berkeley National Laboratory); BOSQUE, Ernesto (National High Magnetic Field Laboratory); COOLEY, Lance; DAVIS, Daniel (FSU/NHMFL); HELLSTROM, Eric (Florida); JIANG, Jianyi (Florida State University); KIM, Youngjae (National High Magnetic Field Laboratory); LARBALESTIER, David (National High Magnetic Field Laboratory); LU, Jun (NHMFL); TROCIEWITZ, Ulf (NHMFL); HUANG, Yibing (Oxford Superconducting Technology); PARRELL, Jeff (Oxford Superconducting Technology)

Presenter: SHEN, Tengming (Lawrence Berkeley National Lab)

Session Classification: WED-PO2-111 High Field Accelerator Magnets II: Hybrid and HTS