



Contribution ID: 1080

Type: **Invited Oral Presentation**

## **M3Or1A-01 [Invited]: Recent progress on CORC® cable, wire and magnet development**

*Wednesday, July 24, 2019 9:30 AM (30 minutes)*

Advanced Conductor Technologies is developing high-temperature superconducting Conductor on Round Core (CORC®) cables and wires wound from REBCO coated conductors for use in high-field magnets. Magnet applications on which the conductor development is focused on include compact fusion magnets that operate at currents between 50 and 100 kA at fields of 12 – 20 T and accelerator magnets that operate at currents exceeding 10 kA and engineering current densities ( $J_e$ ) of over 600 A/mm<sup>2</sup> at 4.2 K in a background field of 20 T. Here, we outline the latest results of CORC® cable and wire development tailored for each magnet application. We'll discuss the improvements of CORC® wires with respect to in-field performance and flexibility required for high-field accelerator magnets through improved pinning performance and reduction of the substrate thickness from 30 down to 25  $\mu\text{m}$  in tapes from SuperPower. We will discuss the design of several CORC® Cable-in-Conduit-Conductors (CICC) for fusion magnets that will be tested at 80 kA current in the 10.8 T background field of the SULTAN test facility at the Paul Scherrer Institute in Switzerland later this year.

CORC® cables and wires are becoming mature magnet conductors and several magnet programs that incorporate CORC® conductors will be discussed. These include the canted cosine-theta accelerator magnets developed at Lawrence Berkeley National Laboratory, the Common Coil insert coil at Brookhaven National Laboratory, and several CORC® insert solenoids at CERN and the Applied Superconductivity Center at the NHMFL.

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**Session Classification:** M3Or1A - REBCO & Nb<sub>3</sub>Sn Cables for Magnets