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## [Invited] A subscale canted $\cos\theta$ dipole magnet using high-temperature superconducting STAR<sup>TM</sup> wires

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A dipole magnet generating 20 T and beyond will require high-temperature superconductors such as  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8-x}$  (Bi-2212) and  $\text{REBa}_2\text{Cu}_3\text{O}_{7-x}$  (RE = rare earth, REBCO). Symmetric tape round (STAR<sup>TM</sup>) wires based on RE-BCO tapes are emerging for such an application especially because of their unique tolerance to bending to a radius as small as 15 mm. Although STAR<sup>TM</sup> wires demonstrate excellent transport performance at 77 and 4.2 K, there is limited report on the magnet development based on STAR<sup>TM</sup> wires. Here we report a subscale canted  $\cos\theta$  dipole magnet using STAR<sup>TM</sup> wires to evaluate their performance in a magnet configuration. The magnet was wound with two STAR<sup>TM</sup> wires, electrically in parallel and no transposition between the two wires. The transport performance of the magnet was measured at 77 and 4.2 K, in addition to the dipole field at the magnet center. The magnet fabrication and test results allowed us to identify further development needs for both STAR<sup>TM</sup> conductors and associated magnet technology to enable future high-field REBCO dipole magnets.

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