Contribution ID: **2593** Contribution code: **WEPM065** Type: **Poster Presentation**

What is needed for BISCO to work in a dipole insert for 20 tesla hybrid accelerator magnets

Wednesday, 10 May 2023 16:30 (2 hours)

Developing HTS dipole inserts producing fields larger than 5 T within 15 T Nb3Sn outserts is necessary to generate 20 T or higher fields for future high energy colliders. Dipole inserts based on the cos-theta coil geometry with various stress management concepts and Bi2212 super-conducting strand and cable are being developed at Fermilab both within and beyond the U.S. national effort. On paper, the potential reach for the maximum magnetic field in existing or planned Nb3Sn outserts is close to 20 T, thanks to the progress realized in Bi2212 wires'critical current density. To achieve the Bi2212 potential in accelerator magnets, however, a number of technological challenges still have to be faced. These for instance include the need to design billets that are adequate for Rutherford cabling; developing insulation processes and materials that prevent leaks, which reduce transport current and increase the risk of shorts; control and limit Bi2212 coils'stresses and strains; reconsider the Split Melt Process (SMP) to lower costs and simplify the processing. This paper reviews Bi2212 conductor properties and coil technolo-gies, and proposes new ideas to face the challenges that Bi2212 still presents as an accelerator magnet conductor.

Funding Agency

US Department of Energy

Footnotes

I have read and accept the Privacy Policy Statement

Yes

Primary author: BARZI, Emanuela (Fermi National Accelerator Laboratory)

Presenter: BARZI, Emanuela (Fermi National Accelerator Laboratory)

Session Classification: Wednesday Poster Session

Track Classification: MC7: Accelerator Technology and Sustainability: MC7.T10: Superconducting Magnets