



Contribution ID: 436

Type: Poster

Iron-based wires and tapes produced with simple and scalable methods

Tuesday, June 25, 2019 3:55 PM (1 minute)

Among the iron-based Superconductors (IBS) the 11 and the 122 family have attracted much attention because they show excellent superconducting properties for high field applications. The 11 family is also very robust against proton induced damage, and this is important in view of applications of superconductors in radiation-harsh environments such as particle accelerators. Moreover, conductors of these two phases produced as Powder In Tube (PIT) wires or Coated Conductors (CC) have reached a transport J_c that exceeds the practical level of 105 A/cm² at 4.2 K and 10 T but the route to the realization of conductors in a scalable way is still long though.

In this work we explore the possibility to produce 11 coated conductors and 122 ex-situ PIT wires in a simple and scalable way. On one side we are working at the development of prototype IBS CC through the deposition of thin films of the phase Fe(Se,Te) via PLD on different metallic templates with and without buffer layers. In parallel, starting from home-made (Ba,K)Fe₂As₂ powders produced at SPIN, we produced short samples of ex-situ PIT wires and tapes at ambient pressure.

Acknowledgments

We acknowledge funding from CERN for this collaboration activity within the FCC Study (addendum FCC-GOV-CC-0086).

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Session Classification: Poster session

Track Classification: Superconducting magnets & associated technologies