



MT 26
International Conference
on Magnet Technology
Vancouver, Canada | 2019

Contribution ID: 959

Type: **Contributed Oral Presentation**

Wed-Af-Or14-07: Recent advances in iron-based superconducting wires for high-field applications

Wednesday 25 September 2019 17:30 (15 minutes)

Iron-based superconductors (IBS), especially 122 type, are very promising candidates for high-field applications because of its ultrahigh $H_{c2} > 70$ T at 20 K, low anisotropy (< 2 for 122), and ease of fabrication. Recently, thanks to the great supports from Chinese government, significant progresses on the IBS wires have been made, in terms of both J_c enhancement and practical research. In this talk, the overview of the recent progress will be provided. Firstly, the highest transport J_c values have achieved 0.15 MA/cm² ($I_c = 437$ A) at 4.2 K and 10 T in densified and textured 122 tapes. The transport J_c measured at 4.2 K under high magnetic fields of 27 T is still on the level of 55 kA/cm². Secondly, in order to reduce costs and improve the mechanical strength, high strength stainless steel/Ag and Cu/Ag 122 composite conductors have been fabricated, with transport J_c above 50 kA/cm² in 10 T. For round wires, the highest J_c value reached 31 kA/cm² in Cu/Ag composite sheathed wires at 4.2 K and 10 T, obtained by the hot-isostatic-press technology. High- J_c 7-, 37-filament 122 wires were successfully fabricated by the PIT method. Thirdly, based on the experience of high-performance short samples and multifilamentary wires process, high performance 100-m-long multifilamentary superconducting tape has been produced using the scalable rolling process, confirming the great potential for large-scale manufacture. Finally, the latest results of the first joint between 122 IBS superconducting wires will be presented.

Author: Prof. MA, Yanwei (Institute of Electrical Engineering, Chinese Academy of Sciences)

Presenter: Prof. MA, Yanwei (Institute of Electrical Engineering, Chinese Academy of Sciences)

Session Classification: Wed-Af-Or14 - Novel Wire Processes and Development - in Memoriam of Prof. Kyoji Tachikawa