Recent Progress in Fe-based Superconducting Wires and Tapes

Yanwei Ma

Institute of Electrical Engineering, Chinese Academy of Sciences, Beijing 100190, China

E-mail: ywma@mail.iee.ac.cn

Abstract **- The development of Fe-based superconducting wires at IEECAS has progressed rapidly resulting in improving the wire performance and fabricating the world-first 100 m class wires. A 115-meter-long Sr122 wire fabricated by PIT method has reached an average J_c of 13 kA/cm^2 at 10 T, 4.2 K. On the other hand, transport J_c in 122 type short samples has reached over 50 kA/cm^2 at 27 T and 4.2 K, the high-density nano-scale defects formed within superconducting grains may account for this large in-field J_c. Low cost Cu-sheathed Sr122 tapes with large engineering J_e of >10 kA/cm^2 in 10 T at 4.2 K have been made at a low temperature of 740 °C. Additionally, scalable techniques to fabricate 19- and 114-multifilamentary Sr122 conductors for low ac loss are being developed. High-strength 122 type composite tapes are being investigated. Progress in all these areas will be outlined in this presentation.**

Keywords (Index Terms) **– Iron-based wires and tapes, high current density J_c, scalable rolling process, 100 m class 122 wire.**

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