

Recent Progress in Fe-based Superconducting Wires and Tapes

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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/cm² at 10 T, 4.2 K. On the other hand, transport J_c in 122 type short samples has reached over 50 kA/cm² 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/cm² 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.

IEEE/CSC & ESAS SUPERCONDUCTIVITY NEWS FORUM (global edition), No. 42, October 2017.

Received October 11, 2017; Selected October 17, 2017. Reference STP607; Category 2, 5.

This invited presentation 2MO3-01 was given at EUCAS 2017, September 17-21, 2017, Geneva, Switzerland.