## WBP8-8

# Development of artificial cracked RE123-coated conductor for realizing compatibility of critical current improvement and diamagnetism reduction

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The filamentation of tape shaped RE123-coated conductors is important to reduce the shielding current and Ac loss in the wire and coil, but the critical current is usually decreased [1]. To increase the critical current, a method is artificial pin doping, however, it is ineffective on reducing of the shielding current or AC loss. Realizing compatibility of critical current improvement and AC loss reduction is important to develop a high field magnet and highly-efficient AC devices. To achieve both, we suggested an artificial cracked RE123-coated conductor. In last year, we reported the development of split wire with 16-main-core by electrical separating by bending stress (ESBS) method [2]. In this study, the wire was fabricated with tear stress along width direction of the wire, then the cracks were formed along longitudinal direction of wire. In experiments, several samples were prepared, and the critical current was increased 14% than the original wire at 0.7 T, with great decreases of diamagnetism (shielding current). The fabrication method and the results will be discussed in upcoming ISS2019 at Kyoto.

[1] Xinzhe Jin, Hidetoshi Oguro, Yugo Oshima, Tetsuro Matsuda and Hideaki Maeda, "Development of a $REBa_2Cu_3O_{7-\delta}$ multi-core superconductor with “inner split” technology," Superconductor Science and Technology **29** (2016) 045006 (8pp)

[2] Xinzhe Jin, Yasuteru Mawatari, Toshihiro Kuzuya, Yusuke Amakai, Yoshinori Tayu, Naoki Momono, Shinji Hirai, Yoshinori Yanagisawa, Hideaki Maeda, "Fabrication of 16-main-core RE123 split wire using inner split method," IEEE Transactions on Applied Superconductivity **29** (2019) 6601304 (4pp)

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