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Wed-Af-Po.05-07: Transverse Lorentz stress experienced by REBCO tape in ultrahigh magnetic field

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REBCO coated conductor has great potential to be used in ultra-high field magnets [1]. In such magnets, it is crucial to manage the high mechanical stress on REBCO due to electromagnetic force. The commercial REBCO tapes is strong in the longitudinal direction but is prone to delamination by tensile stress in the thickness direction. It had been observed that transverse tension by electromagnetic force could delaminate some commercial REBCO tapes [2].
In this work, we generated screen current in REBCO samples by either fast ramping magnetic field while sample is stationary or rotating a REBCO sample in a fixed magnetic field up to 30 T. The goal is to create high transverse tensile stress to study the possible delamination behavior. The experimental results will be presented. The implication of the results to the design of ultrahigh field REBCO magnet is discussed.

Reference
[1] S. Hahn, et al, "45.5-tesla direct-current magnetic field generated with a high-temperature superconducting magnet", Nature, vol. 570, pp. 496-99, 2019.
[2] M. Bonura, et al., "Quench concomitant to Lorentz force induced delamination in commercial REBCO coated conductors", 2OrSM-4, MT-28, Aix-en-Provence, France, Sept. 10, 2023.
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