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Thu-Mo-Po.06-04: Investigation about the fatigue properties of REBCO coated conductor tapes with applied transport current under background magnetic field

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The REBCO coated conductor (CC) tapes used in high-field magnets are subjected to a variety of mechanical and thermal loads, including stress during the manufacturing process, Lorentz forces during operation, as well as repeated electromagnetic and thermal cycles. It is crucial for the magnet designers to know the fatigue properties of CC tapes to ascertain their service life under operating conditions.

The studies of the fatigue properties of CC tapes have been done with various temperatures, with or without a background magnetic field, with axial tension, through-thickness tensile stress and U-shaped bending. In this work, the fatigue properties of CC tapes with applied transport current under a background magnetic field is studied so that the effects of transverse Lorentz force on the tensile stress fatigue can be evaluated. Special approach of current feeding and/or voltage pick-up was taken to prevent the burning of samples during the tests.

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