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Sat-Mo-Po.05-02: Quench measurements on ReBCO conductors in applied magnetic fields above 15 T

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The high current density of ReBCO conductors at elevated fields makes them particularly suitable for high-field applications. One of the key challenges in the design of high-field ReBCO devices is effective quench detection and protection, making it crucial to investigate the magnetic field-dependent quench behavior of ReBCO conductors. The minimum quench energy (MQE) is known to decrease with increasing background field due to the reduced critical temperature and current sharing temperature. Higher magnetic field may increase the normal zone propagation velocity (NZPV) because of the reduced temperature margin, but they may also decrease the NZPV due to the reduced critical current density. In this study, the MQE and NZPV of ReBCO conductors were measured in applied fields above 15 T using the 200 mm bore water-cooled resistive magnet developed by the High Magnetic Field Laboratory at the Chinese Academy of Sciences, with transport currents ranging from 50% to 70% of I_c . The measurement results are analyzed, discussed and compared.

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