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Wed-Mo-Po3.11-03 [90]: A fast turnaround experimental platform for testing quench initiation and detection of REBCO coated conductors for high-field magnet applications

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High-field magnet technology based on REBCO coating conductor is facing several critical challenges, one of which being quench detection and protection in various working conditions with or without strong stresses. We describe a fast turnaround experimental platform for testing quench initiation and detection of REBCO coated conductors for high field magnet applications.

It is essentially a single-layer coil wound from 2 m long REBCO tapes that we can test a couple of such coils a day at a temperature ranging from 4.2 K to 77 K and in a background field of up to 15 T (at 4.2 K). It is adapted from a spiral coil technique that was successfully used to test the degradation limit of Bi-2223 and Bi-2212 wires carrying a large current in a high magnetic field and subjecting to a strong axial stress during a quench. We describe results of our experiments on coated conductors with different thickness of copper stabilizers at different temperatures, different magnetic fields, and with or without axial stresses. The experimental results are compared with the numerical results by a quench simulation code.

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