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M2Po2E-01 [49]: Assessment of current-sharing of fully-excited Nb₃Sn Rutherford cable with modified ICR at 4.2 K using a superconducting transformer

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Current-sharing was measured for fully-excited Nb₃Sn Rutherford cable at 4.2 K and various I/I_c , using a superconducting transformer. Interstrand contact resistance was modified by different preparation conditions: as-is and low temperature vacuum diffusion bonding. Measurements were performed in pool boiling liquid helium in background fields of up to 15 T with magnetic fields applied parallel to the flat face of the cable. Normal-zones were initiated with surface mounted graphite epoxy heaters. Normal-zone formation was monitored using voltage taps and Type-E thermocouples. The results were correlated with interstrand contact resistance values, themselves a function of the cable preparation protocol. These experimental results are discussed in terms of a stability diagram, and interpreted in terms of a model discussing the importance of minimum quench power and different quench behaviors.

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