

Recovery Propagation in Coated Conductors

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We investigated recovery propagation in coated conductor (CC) tapes. The CC has an Ag protection layer and was grown on hastelloy C substrates. After simulated AC fault current was applied to the tapes, small current was applied for resistance measurement during recovery. Images of the tapes were recorded with a video camera simultaneously when the measurements were taken. The tapes were placed flat and immersed in liquid nitrogen during the experiment. In some cases the resistance decreased slowly first, and then faster to zero. In the other cases it decreased monotonously to zero. Comparison of resistance and image data showed that bubbles were on the whole tapes during the period of the initial slow resistance decrease, indicating that the whole tape was still in quench. During the period of faster and monotonous decrease, in contrast, the area where bubbles were observed diminished as time elapsed. This tells that recovery propagated during the period. When the resistance reached zero the bubbles ceased to be observed. This observation was understood with the concept of heat transfer within the tape and to the surrounding liquid nitrogen.

Keywords : recovery, propagation, coated conductor, heat transfer

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