Contribution ID: **37** Type: **Poster presentation (105min)**

Analysis of the Nb3Sn strand microstructure after full-size «SULTAN» test of an ITER TF conductor sample

Tuesday, 8 July 2014 14:15 (1h 45m)

The study of defects generated in superconducting filaments of Nb3Sn strands under electromagnetic and thermal cycling was carried out for the TFRF3 cable-in-conduit-conductor (CICC) sample passed final testing at the SULTAN test facility. The TFRF3 sample was manufactured from the qualification RF toroidal field CICC. The strand samples were taken from different locations in cross–section of TFRF3 and different positions along its axis in relation to background magnetic field. Qualitative and quantitative analysis of defects were carried out using metallographic images obtained by Laser Scanning Microscope. We analyze number, types, and distribution of defects in filaments of Nb3Sn strand samples extracted from different petals of TFRF3 in dependence on a strand location in cross–section (the center of petal, nearby the spiral, nearby the outer jacket) and also a strand position in relation to background field (high field zone or low field zone). The results about the defects distribution are presented and discussed.

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Session Classification: Tue-Af-Posters Sessions 1.5