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## **Analysis of the structural transformation of an ITER TF conductor jacket tube**

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Developing a systematic and thorough framework for the TF jacket is of profound repercussions to ITER. Here, we present an extensively observation and analysis of structural transformation for TF jacket after tensile test at cryogenic temperature with a phase transformation from  $\gamma$ -austenitic phase to  $\alpha'$ -martensite. We found with decreasing the temperature, less external energy is needed to induce the  $\gamma$ - $\alpha'$  phase change. The maximum volume fraction of  $\alpha'$ -martensite phase is occurred at fracture and a gradual transformation of  $\gamma$  into  $\alpha'$  occurs parallel the longitudinal direction. Overall microanalysis reveals intersections of deformation bands, dislocation channels and twins on  $\{111\}$  plane as the favorable sites can promote the generation of  $\alpha'$ -martensite phase. Moreover, we propose our assay to enable exhibition the deformation mechanism and help to guide and explain the structural physics of TF jacket in ITER.

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