Contribution ID: **16** Type: **not specified**

MANDREL TEST SIMULATION USING THE TRANSURANUS CODE: INSIGHTS FROM AN OFFERR PROJECT

Thursday 30 October 2025 09:50 (25 minutes)

The paper presents the work carried out within the framework of the OFFERR European User Facility Network, aimed at evaluating the mechanical behaviour of unirradiated Cr-coated and uncoated E110-like cladding under mandrel loading conditions. Experiments were conducted at 25 and 300℃, and the cladding response was preliminary simulated using the TRANSURANUS fuel performance code. Two boundary condition strategies were investigated: (i) imposing the mandrel-cladding contact pressure obtained from 3D finite element analyses, and (ii) prescribing the cladding inner wall deformation. The results highlight the need for improved material models and demonstrate the limitations of 1D approaches in capturing complex mechanical responses under non-axisymmetric loading.

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Session Classification: 3

Track Classification: ATF Modelling