Contribution ID: 200 Type: Oral

Thermal evolution in metals as revealed by in-situ neutron diffraction

Friday, 26 November 2021 15:40 (15 minutes)

The thermal evolution in metals plays an utmost important role in thermo-mechanical processing. Lattice expansion not only reveals conventional thermal expansion but moreover gives insight to order parameters, change of chemical composition and pressure. Peak widths reveal microstructural changes, as well as texture evolution, while primary extinction can be used to study defect mechanisms. Quantifying anisotropic and phase related expansion mismatch allows to design alloys with better mechanical properties. Here I give an overview with selected examples on bulk zirconium alloys, aluminium alloys. Focus will be given on materials after severe plastic deformation, in which different states of thermal stress relaxation, microstructural recovery and recrystallization can be distinguished.

Presenter Gender

Man

Do you wish to take part in the Student Poster Slam

Condition of submission

Yes

Students Only - Are you interested in AINSE student funding

Level of Expertise

Expert

Pronouns

Which facility did you use for your research

Australian Centre for Neutron Scattering

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Session Classification: Manufacturing & Engineering

Track Classification: Manufacturing & Engineering