



SEMINARIOS INTERNACIONALES DE FRONTERAS DE LA CIENCIA DE MATERIALES

UNIVERSIDAD POLITÉCNICA DE MADRID
CAMPUS DE EXCELENCIA INTERNACIONAL MONCLOA



POLITÉCNICA

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MODELING OF EXPERIMENTALLY CHARACTERIZED MICROSTRUCTURES TO IDENTIFY THE INFLUENCE OF GRAIN NEIGHBORS ON HETEROGENEOUS DEFORMATION

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RESUMEN

Deformation within a given grain is highly influenced by deformation in its neighboring grains, which impose boundary conditions on each other that vary spatially. To investigate this, detailed experimental measurements of heterogeneous deformation that include local stress and strain measurements are desirable to assist model development and validation.

Examples of this kind will be described:

- (1) in-situ characterization of solder joints under thermo/mechanical loading that reveal the local stress tensor,
- (2) in-situ tensile deformation of polycrystalline titanium and titanium alloys in which 3-D tomographic diffraction measurements are made to track nucleation of mechanical twins, and related local plastic strain using near-field, far-field and differential aperture x-ray microscopy, and SEM/EBSD measurements.

These experiments provide 3-D data for simulations that allow local stress evolution and identification of effects of slip transfer to be identified and modeled. Supported by NSF, DOE/BES, and the Advanced Photon Source beamlines 1, 6, and 34.



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