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Ansto



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## Simultaneous orientation and strain determination in polycrystals using the Maia detector

Thursday, 24 November 2016 12:00 (15)

X-ray micro-beam Laue diffraction is a powerful tool for mapping the orientation and elastic strain within polycrystalline materials. Interactions between neighbouring grains influence the macroscale characteristics of a material, particularly its deformation behaviour, damage initiation and propagation mechanisms. Here we report on recent experiments using energy scanning diffraction of a polycrystalline nickel foil at the XFM beamline using the Maia energy dispersive area detector. Using the elastic back scatter measured by the pixelated Maia detector we are able to determine local crystallographic orientation within the polycrystalline foil. Knowledge of the photon energy of specific Bragg peaks also makes it possible to determine the strain state within the sample. Here the elastic strain was mapped across the sample and the full elastic strain tensor determined. These results thus demonstrate the first steps towards simultaneous elemental, crystallographic orientation and strain imaging at the microscale.

### Keywords or phrases (comma separated)

Diffraction, Energy dispersive, Strain, Orientation

### Are you a student?

Yes

### Do you wish to take part in the Student Poster Slam?

No

### Are you an ECR? (<5 yrs since PhD/Masters)

No

### What is your gender?

Male

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