



Session **Restricted access**

DFXM characterisation of dislocation avalanches with concurrent acoustic emission measurements

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During plastic deformation the motion of dislocations is intermittent giving rise to random sudden localised strain bursts, called dislocation avalanches. The aim of the proposal is to understand how and where such dislocation avalanches are triggered and to develop novel methodologies to monitor them. To this end, we propose a Dark-field X-ray microscopy (DFXM) experiment to characterise in situ the spatial structure of these avalanches and their fluctuation during micropillar compression. The experiment will be coupled with acoustic emission (AE) measurements in order to establish a quantitative relationship between dislocation avalanches and the emitted AE signals. The results are expected to shed light on the fundamentals of dislocation patterning and by deciphering the meaning of AE signals, they will have the potential to enhance the durability of engineering materials.

Experimental data

Data is under embargo until 2028 but could be released earlier. Currently, it is only accessible to proposal team members.

[Access data for experimental team](#)

Experimental report

No report was found for HC-5802. Proposers and session participants may submit it via the [ESRF User Portal](#).

Reference

Researchers must acknowledge the source of the data and cite its unique identifier as well as any publications linked to the same raw data. Below is the recommended format for citing this work in a research publication.

Bathini, L., Borbely, A., Ispánovity, P. D., Kalacska, S., Lukács, K., & Ugi, D. (2028). DFXM characterisation of dislocation avalanches with concurrent acoustic emission measurements [Dataset]. European Synchrotron Radiation Facility. doi.org/10.1515/ESRF-ES-2019958061

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