

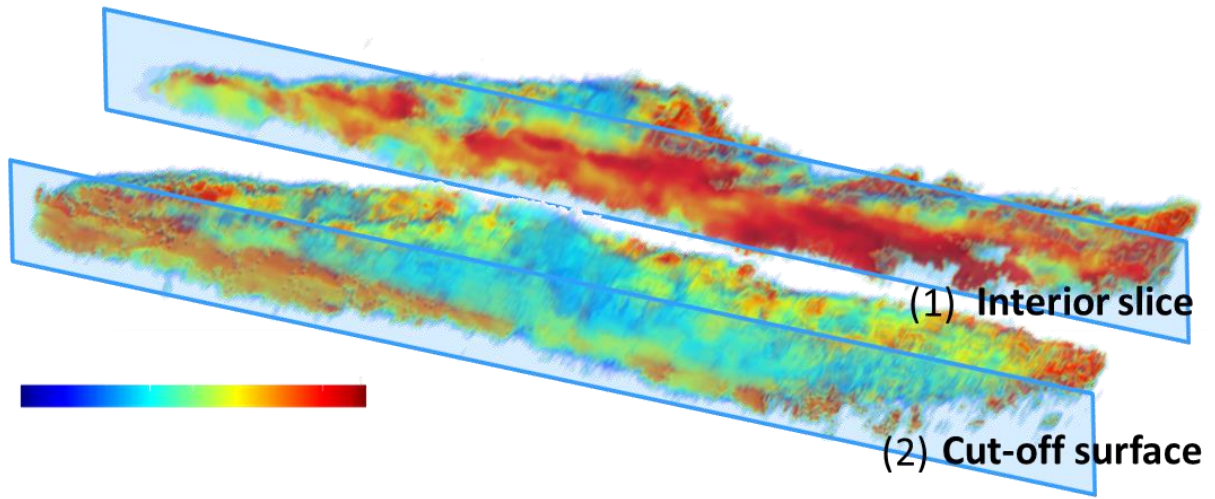


## Experiment Report Form

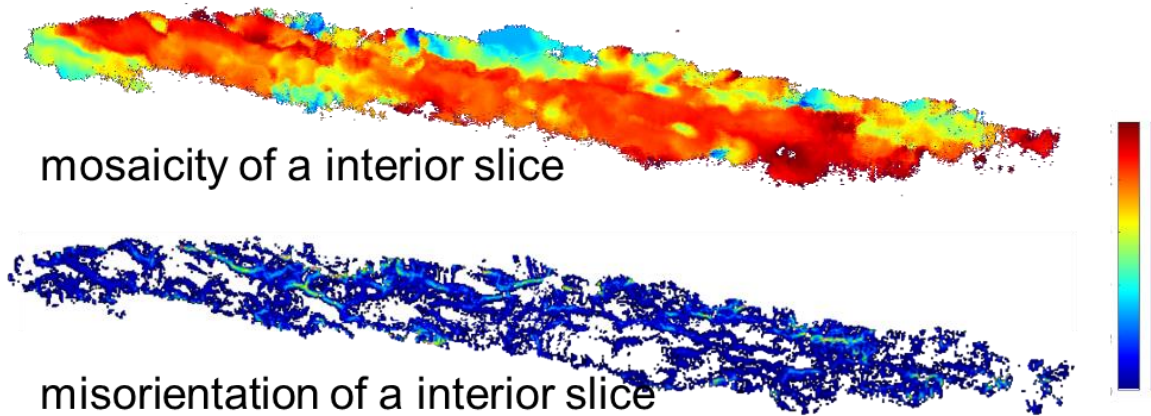


<b>Beamline:</b> ID06-HXM	<b>Experiment title:</b> Crack-free Laser Additive Manufacturing	<b>Experiment number:</b> MA 4743
<b>Shifts:</b> 18	<b>Date of experiment:</b> from: 07/07/2021 to: 13/07/2021	<b>Date of report:</b> 09/09/2021
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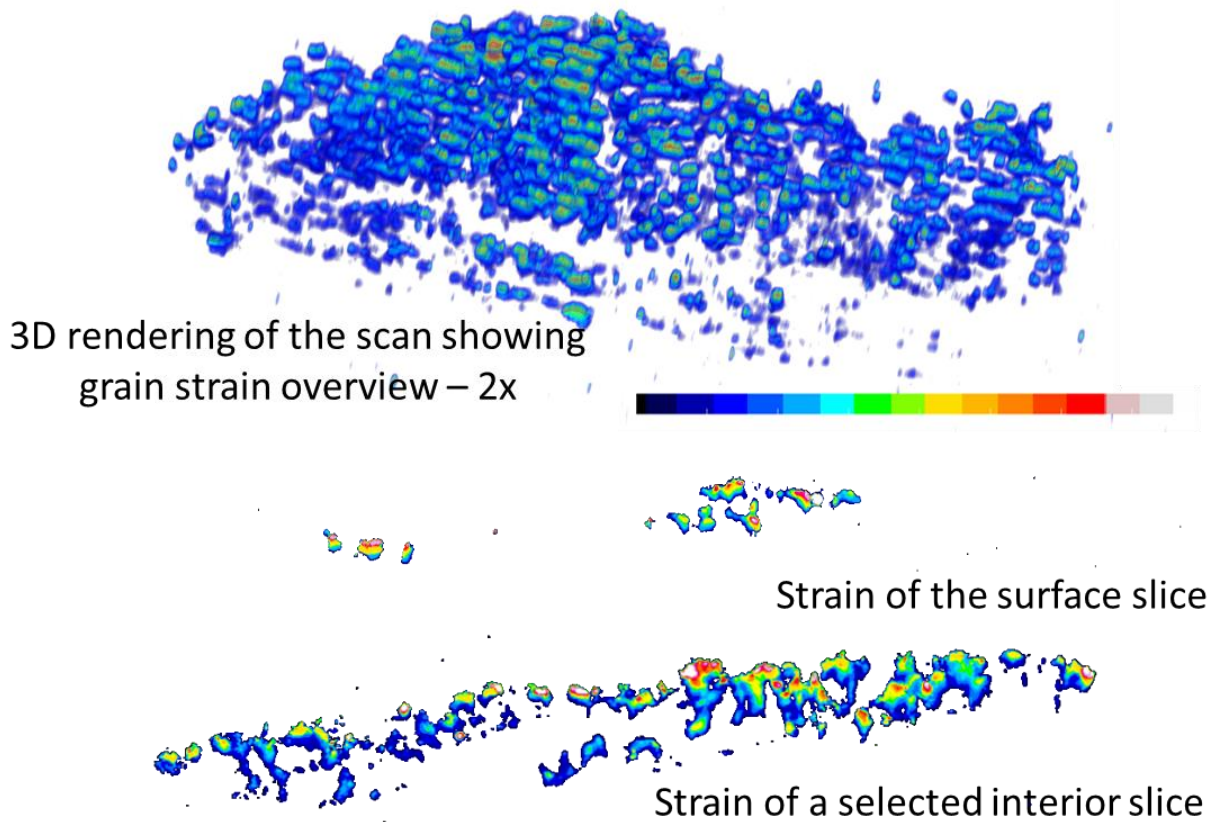
**Report:** We use DFXM for the characterisation of 3D orientation variation and strain distribution of a DED-LAM formed grain from the cut-off surface to the fully embedded interior. This is the first time that the local misorientation and strain have been measured in 3D experimentally for a LAM microstructure and compared with EBSD measurements. The results will firstly shed new light in the understanding of the microstructure development during LAM and their impact on the mechanical properties and secondly will provide guidance in the practise of EBSD and the interpretation of results to understand LAM microstructures.



**Figure 1. Reconstructed 3D mosaicity mapping of the selected grain**



**Figure 2. Reconstructed mosaicity distribution**



**Figure 3. Reconstructed strain distribution**