

RAPID EBSD

- An Alternative to fast EBSD mapping

RAPID EBSD is a new and powerful ESPRIT 2 software feature based on a method developed at Imperial College in London, UK.

The new capability combines high quality ARGUS™ ForeScatter (FSE) images with state-of-the-art image segmentation algorithms and sparse EBSD/EDS data acquisition to reconstruct normal EBSD/EDS maps in the shortest time possible.

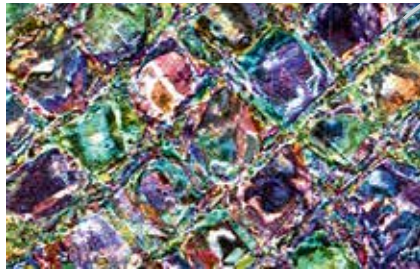
Benefits

- Increased efficiency
- Fast mapping with long exposure times
- Better statistics in EDS spectra
- Less damage to beam sensitive samples
- Reduced charging on non-conductive samples

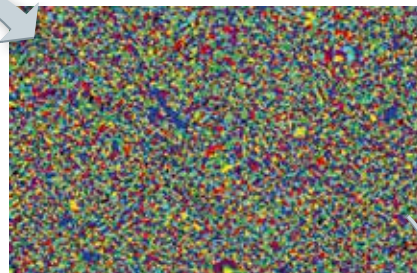
Applications

- Grain size statistics
- Crystallographic texture
- Materials producing very weak diffraction signal
- Beam sensitive samples

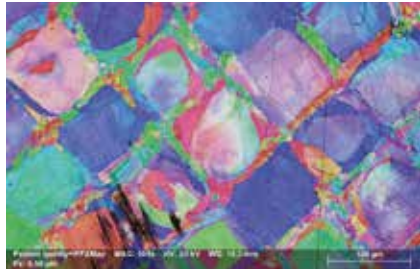
RAPID EBSD workflow



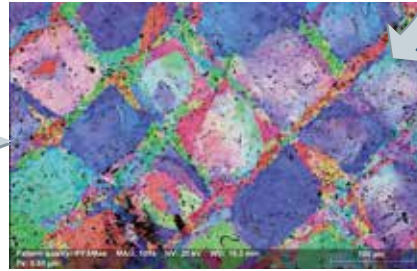
1. ARGUS™ FSE image



2. Result of segmentation process



Standard EBSD map



3. Reconstructed RAPID EBSD map

Major steps in the workflow of RAPID EBSD and output comparison vs. standard EBSD mapping: High detail ARGUS™ FSE image showing orientation contrast in an additively manufactured (AM) austenitic stainless steel (top-left), the resulting image after multiple processing steps, e.g. filtering, segmentation and reconstruction from which a list of measurement points is created (top-right), reconstructed orientation map using RAPID EBSD (bottom-right) and corresponding orientation map acquired using the normal EBSD mapping (bottom-left).

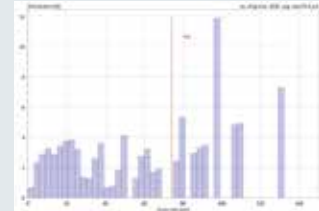
Main features

- Fully automatic:
 - Detector movement
 - ARGUS™ image capture
 - Image processing
 - Sparse EBSD/EDS data acquisition and map reconstruction
- User can change/refine major parameters, e.g. segmentation threshold
- Real time view of map reconstruction during sparse data acquisition

Benchmark details

- ARGUS™ image capture down to 8 μs per pixel
- Reconstructed map built from an FSE image captured up to 25 times faster vs. an EBSD map acquired at 4,500 fps
- Reduction in total number of data points to be acquired by one to two orders of magnitude
- Total acquisition time for a map of 1M points: ~ 3 min
- No significant difference in mean equivalent diameter compared to standard EBSD maps
- Insignificant or no differences between crystallographic texture results

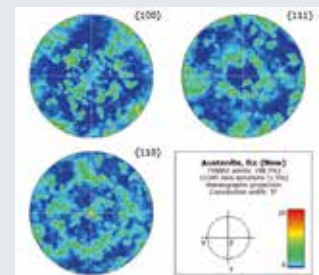
RAPID vs. standard EBSD



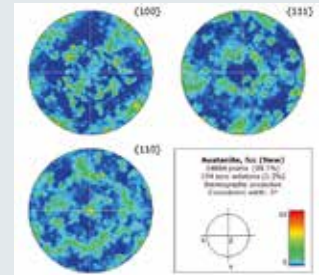
Grain size distr. - standard EBSD



Grain size distr. - RAPID EBSD



Pole figures - standard EBSD



Pole figures - RAPID EBSD

● Bruker Nano GmbH

Berlin · Germany
 Phone +49 (30) 670990-0
 Fax +49 (30) 670990-30
 info.bna@bruker.com

www.bruker.com/quantax-ebsd

