

EBSD eFlash FS

High sensitivity and throughput EBSD detector



Detector sensitivity is of utmost importance for high-speed EBSD applications. The eFlash FS EBSD detector has been designed for maximum sensitivity to allow high-speed EBSD measurements without compromising data quality even on difficult cases like deformed or lightweight materials.

To further improve the pattern quality, the cooling system of the eFlash FS has been upgraded to lower its functioning temperature and therefore reduce the dark current of the CMOS camera as much as possible.

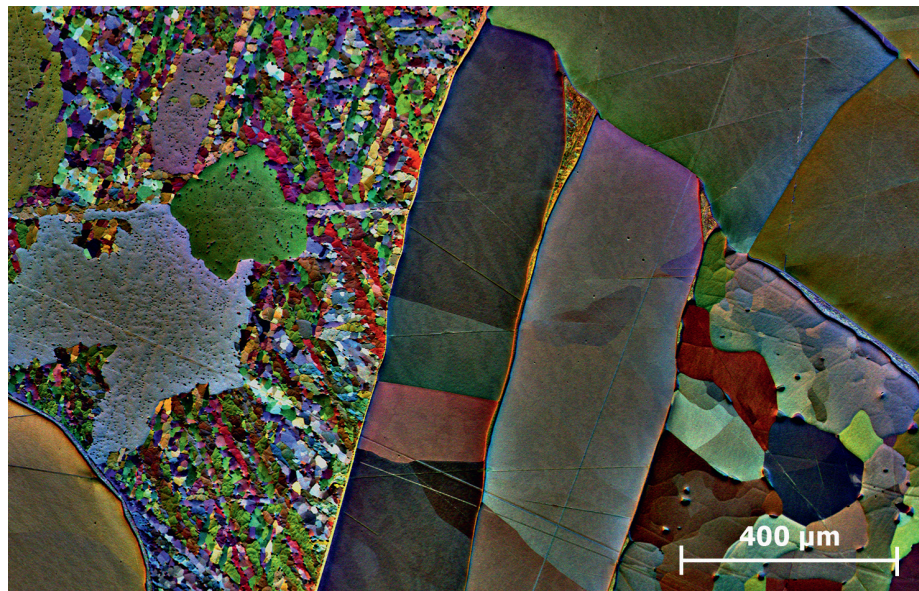
The high quantum efficiency (QE) CMOS camera combined with a high speed and high efficiency phosphor screen makes the eFlash FS detector the ideal solution for all "Hough based" EBSD applications, including dynamic experiments like in-situ heating and in-situ tensile/ compression testing.

3D EBSD is another important application that will greatly benefit from the speed and sensitivity capabilities of the eFlash FS detector.

Its excellent sensitivity makes the eFlash FS detector the perfect solution for low kV EBSD applications as well as Transmission Kikuchi Diffraction (TKD) in the SEM a.k.a transmission EBSD (t-EBSD). Orientation mapping in transmission mode using the detector retrofitted with the unique OPTIMUS™ 2 TKD detector head is now possible at speeds of up to 520 frames per second (fps) while achieving an effective spatial resolution of at least 5 nm.

When necessary, the effective spatial resolution can be improved down to 2 nm by using a smaller aperture on the SEM column and still reach acquisition speeds of up to 300 fps with very good indexing rates. With typical measurement times of just a few minutes per map, high-speed TKD not only brings a remarkable increase in efficiency but it also minimizes artifacts induced by beam instability.

False-color ARGUS™ image acquired from an iron meteorite.



Technical Specifications

Feature/ Option	Benefit
Sensitivity	High indexing rates at high acquisition speeds even on deformed materials or materials with a low electron scattering yield
Low functioning temperature/ low dark current high quality optics	Low noise patterns with better indexing quality
OPTIMUS™ 2 TKD	Provides optimum sample-detector geometry for TKD analysis. OPTIMUS™ 2 TKD transforms an SEM into a low kV TEM with orientation mapping as well as dark and bright field imaging capabilities.
ARGUS™ FSE/BSE	Fully automated color-coded orientation contrast (FSE) imaging and grayscale “BSE” like imaging. FSE images are extremely sensitive to small changes in the Kikuchi signal, e.g., residual strain, magnetic domains, etc.
High efficiency / high speed phosphor screens	User-replaceable phosphor screens optimized for high speed and in-situ heating experiments – no compromises between screen efficiency and speed (decay time).
High precision guiding system	Motorized screen positioning with precision better than 10 µm – no detector/screen rotation
Slim detector head design	Provides optimum (best solid angle) conditions for simultaneous EBSD/EDS measurements
In-situ detector tilt	Allows optimization of sample-detector geometry for perfect screen illumination at any WD inside the SEM chamber. This standard feature is high vacuum compatible due to built-in welded bellows.
Collision sensor	Automatic retraction of detector at a speed of 10 mm/s (audio alarm present)
All electronics inside the detector casing	No external boxes – just two Ethernet cables making the connection with the PC

