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Detailed Technical Specifications for Velocity Pro EBSD System (Add on of existing equipment - Fei TM, Nova Nano SEM):

EBSD Specification

National Facility of Texture and OIM, at Indian Institute of Technology Bombay, is planning to upgrade one of their existing EBSD (which is CCD-based) with a CMOS based and latest technology EBSD. The proposed EBSD should be compatible with the Feg-SEM (Fei™, Nova Nano SEM) and already installed EDAX™ EDS. Further, the EBSD and existing EDS needs to work together on a single software platform. This is critical for many applications.

EBSD system should have the following features:

The EBSD camera system should be CMOS based, with 2000 Indexed points per second or better, and an indexing success rate of 99% or better. The system should have feature to assess accuracy of Indexing. The EBSD should be optimized for low-kV data application while working with the aforementioned Feg-SEM.

Camera should have motorized insertion and retraction mechanism. The position accuracy needs to be to be 0.1mm or better. The new system must include an optimized phosphor screen for high speed and high sensitivity collection. The camera should have hexagonal scanning gird for minimizing grain shape artifacts and also should provide consistent distance between neighboring pixels which is important for local mis-orientation analysis of deformed materials. The camera must facilitate/allow direct imaging the sample through collected backscattered signal on the phosphor screen. Further, forward scattering detector must also be provided for imaging.

The camera should have imaging detector to acquire images with atomic orientation, channeling contrast. The system software should include the following features:

(i) Data Acquisition and Mapping Software
(ii) Pole Figure and ODF Software, with both series expansion and binning. Also ability to calculate Scalar texture for different micro-structural quantities
(iii) Phase Reflector File Creation Software
(iv) Software for simulations of Kikuchi pattern dynamically
(v) Imaging and Beam Control Software
(vi) Stage Control Software

EBSD software should have features like dynamic camera optimization. The EBSD software should have feature to improve the signal-to-noise level by averaging each pixel with its surrounding neighboring pixels. The EBSD software must have a provision to check whether a point has been correctly indexed or not (accuracy of Indexing), even it should provide multiple solution for that point.

One Pre-tilt sample holder for EBSD analysis and one offline EBSD analysis software must be provided. Suitable Computer / Analyzer should be provided for integrated EDS-EBSD operation.