

## EBSD: BASICS AND NEW DEVELOPMENTS

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Electron Backscattering Diffraction (EBSD) has become a major tool for the characterization of crystalline samples in the scanning electron microscope. The technique permits the mapping of grain orientations, and makes it possible to identify phases. The backscattered electrons from a tilted sample are made to fall on a phosphorescent screen. The intensity of illumination on the screen is patterned with Kikuchi lines, which carry information about the crystal structure and the orientation of the grain. Any scanning electron microscope used for studying crystalline samples should have EBSD, which is now considered a standard procedure. Among recent improvements to EBSD is the making of three-dimensional orientation maps. An orientation map from a sample surface is two-dimensional. The information can be extended to three dimensions by repeatedly removing a slice from the surface (generally with a focused-ion-beam instrument) and making another map. As an example, these methods have recently been used to show that the coincident-site-lattice analysis of grain boundaries is not as helpful as previously thought. A new taxonomy of grain boundaries – introducing the idea of complexions – is more valuable.