Practical Gains from Forward Model Indexing of EBSD Patterns

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Abstract

Spherical indexing (and dictionary indexing) of Electron Backscatter Diffraction (EBSD) patterns have been shown to provide measurements with higher indexing reliability over that which can be achieved with conventional Hough transform based measurements particularly with low-contrast, noisy patterns. In addition, as spherical and dictionary indexing incorporate the intensity within the bands and not just the band geometry, forward model indexing provides greater ability to resolve pseudosymmetry issues, differentiate crystallographically similar phases, and to index at the full symmetry of the crystal (i.e. not limited to the Laue group symmetry in non-centrosymmetric crystals). These advantages over conventional indexing are certainly beneficial and have been well demonstrated in the literature. This presentation will focus on the practical gains spherical indexing brings to the EBSD system as a whole – namely, spatial resolution, sensitivity, angular resolution and thereby the speed of data collection. The practical improvements forward model based indexing provides will be explored in the context of reliable and efficient characterization of polycrystalline textures.

Keywords: EBSD, spherical indexing, forward model indexing

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