

## Resolving the geometrically necessary dislocation content by conventional EBSD

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From local orientation measurements on planar surfaces by means of electron backscattering diffraction, six components of the lattice curvature tensor can be identified. They allow determination of five components of the dislocation density tensor (thus two more than hitherto reported) and, additionally, one difference between two other components.

When determining the geometrically necessary dislocation content, all available information should be utilized, i.e. all six independent components of the curvature tensor and not only the three or five components of the dislocation density tensor.

With the increased number of available components, improved lower bounds for the total dislocation density are obtained by linear optimization. Taking into account the energy of the elastic strain fields and possible anisotropy, the most favourable dislocation configuration is found by minimizing the total dislocation line energy.

The method is illustrated on deformed metals and rocks.