# Euler angle calculation and evaluation for orientation indexing of Electron Backscatter Diffraction(EBSD)

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Recently Electron Backscatter Diffraction (EBSD) with Scanning Electron Microscope (SEM) is applied to geological science, which is also called SEM-EBSD method. There has been a plenty of application results of cubic crystal systems in metallurgy field. But the lower symmetry crystal system such as 180 degrees symmetry is more interested in wide variety of field, e.g. metallurgy, semiconductor, geology and also in more complicated materials. Those crystal system examples are hexagonal, tetragonal, etc.

EBSD identifies Kikuchi pattern and indexes the orientation. As of symmetry of Kikuchi pattern, some orientation and measurement condition cannot index the orientation right in a single solution, having pseudo-symmetric plurality. The sample has to be tilted 70 degrees. Tilt direction, detector to sample orientation, SEM scanning direction, etc. affect the orientation determination significantly. Three dimensional orientations are defined as following Bunge convention [1][2][3]. But Euler angle calculated from Kikuchi pattern often changes with the acquisition coordinate system. I would introduce each acquisition coordinate system and Euler angle results and how to interpret the Euler angle results, specifically for hexagonal and tetragonal crystal systems.

Reference

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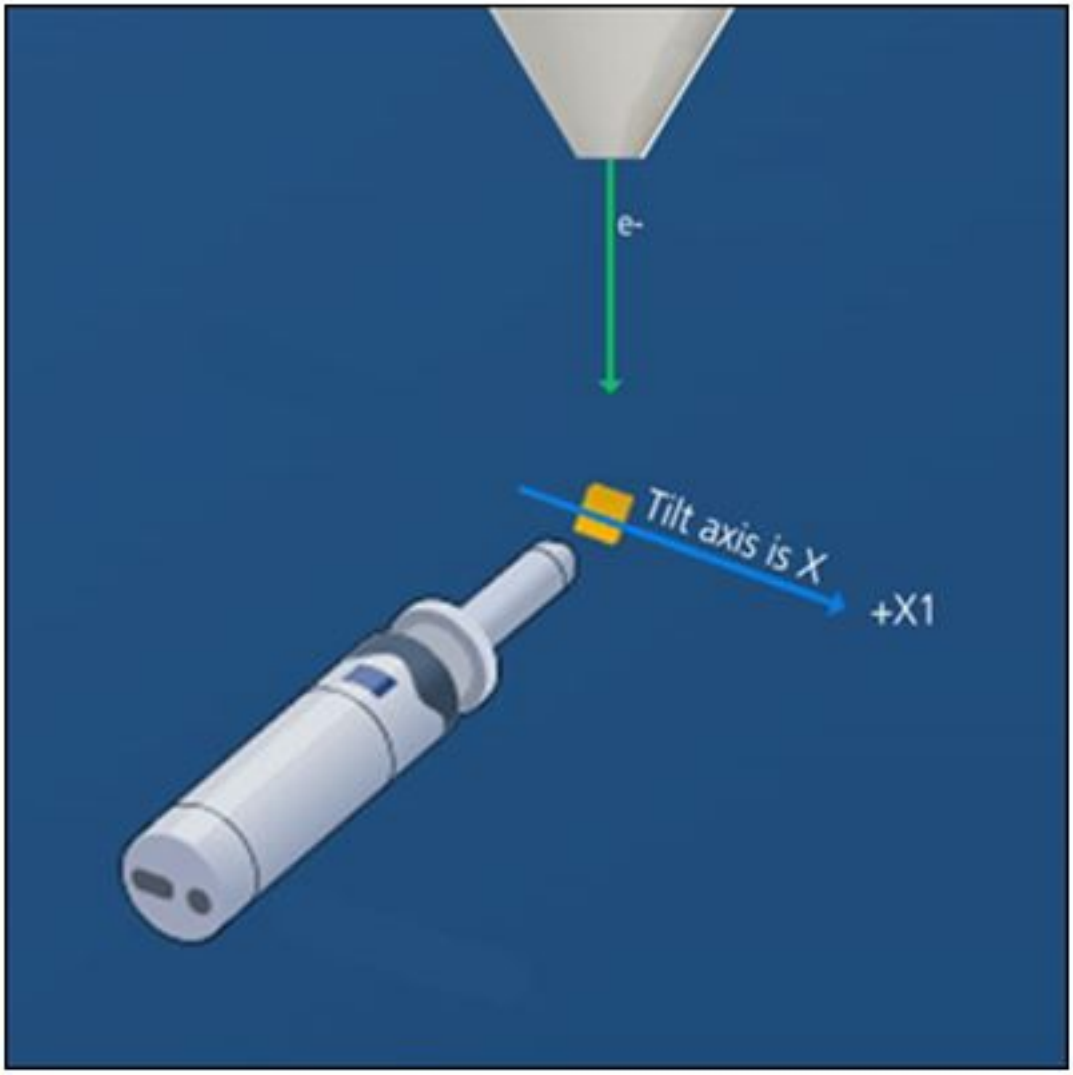


Fig.1 detector to sample direction

 