Crystal Orientation Mapping using ion image series: iCHORD

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A new method, which we name iCHORD (ion CHanneling ORientation Determination), is proposed to obtain orientation maps on polycrystals via ion channeling. The iCHORD method exploits the dependence between grain orientation and ion beam induced secondary electron image contrast. At each position of the region of interest, intensity profiles are obtained from a series of images acquired with different orientations with respect to the ion beam. The profiles are then compared to a database of theoretical profiles of known orientation. The Euler triplet associated to the most similar theoretical profile gives the orientation at that position. The proof-of-concept is obtained on a titanium nitride sample. The potentialities of iCHORD as an alternative to EBSD are then discussed.