

Interactive comment on “EBSD in Antarctic and Greenland Ice” by Ilka Weikusat et al.

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First of all I would like to thank the author for their contribution to the important question concerning the type of dislocations involved during ice deformation. The question of non-basal dislocations is important to better constrain crystal plasticity law used in full field modelling using FFT (Llorens et al 2016, Suquet et al. 2011) or FE method (Richeton 2017). The evidence on non-basal dislocation has been recently highlighted by the previous work of the author using the similar tools (Weikusat et al. 2011) or by Piazzolo et al, 2015 using Nye calculation through Weighted Burgers Vector.

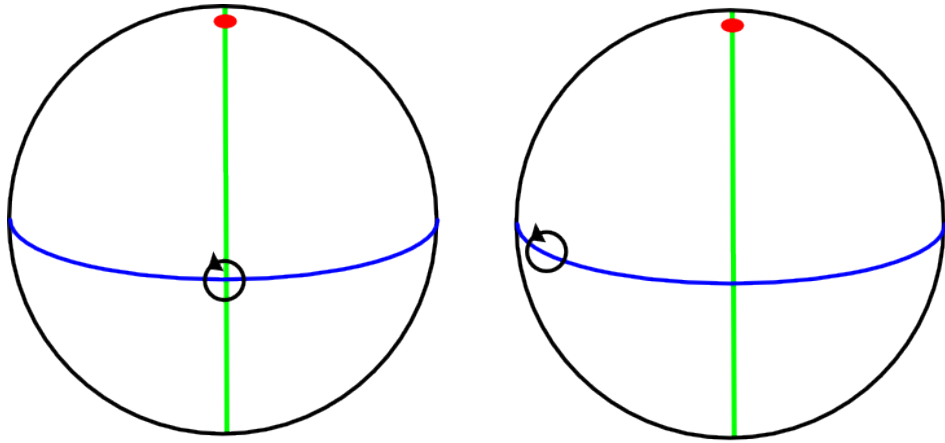
My main concern is about the use of IPF (inverse pole figure) to determine the rotation axis trough the SGB (sub-grain boundary). It can lead sometimes to misinterpretation. For example concerning the N[a] SGB define as “N[a] describes a SGB trace normal to the basal plane (N-type) with rotation axis in the basal plane” (line 9, page 9). These SGB are interpret later as made of “Burgers vector $b = \langle a \rangle$ edge dislocations”. But if the

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information given by the IPF is that the rotation is lying in the basal plane, one cannot conclude directly whether the rotation axis is located within the SGB or perpendicular to the SGB (see figure), which will lead to different conclusions concerning the dislocations invokes. I would therefore suggest to the author to show the result in PF instead of IPF to avoid any ambiguity and misinterpretation.

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Basal plane

• c axis

Boundary trace N

⊙ Possible rotation axis

Fig. 1.