



Recrystallization Diagram for Polar Ice

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Ice is the most frequent mineral on the Earth's surface, however experiences conditions comparable to silicate minerals at high metamorphic grades. In all natural conditions ice is a hot material with homologous temperatures between 0.9 and 0.7 at least. Under such circumstances recrystallization plays a decisive role in governing the state and thus the behaviour of the material. This has been recognized and interpreted in many ice cores in the last decades (Faria et al. in press a) assigning recrystallization regimes to ice sheet depth ranges. This assignment made use of microstructure observations (mainly grain size) and estimated boundary conditions (temperature and stress/strain amounts) which change systematically with depth. To generalize the use of recrystallization regimes we decouple their occurrence from the ice sheet depth information and connect them directly to the activators and causes: strain rate and temperature (Faria et al. in press b).

References:

- Faria, S. H.; Weikusat, I. & Azuma, N. The Microstructure of Polar Ice. Part I: Highlights from ice core research. *Journal of Structural Geology*, in press a, DOI: 10.1016/j.jsg.2013.09.010
- Faria, S. H.; Weikusat, I. & Azuma, N. The Microstructure of Polar Ice. Part II: State of the Art. *Journal of Structural Geology*, in press b, DOI: 10.1016/j.jsg.2013.11.003