



Texture evolution from stage 11 to stage 15 along the Vostok ice core (East Antarctica)

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Textures and microstructures have been measured from 3317 m to 3425 m depth along the Vostok ice core. Large variation of grain sizes and fabrics between interglacial and glacial stages are observed. Glacial ice is characterized by small grain sizes and a very strong concentration of c-axes along the vertical direction. This texture must be produced by localized simple shear. On the contrary, interglacial ice presents much larger grains with a girdle-like fabric, mainly induced by horizontal uniaxial tension.

These remarkable changes of texture characteristics with climate can be related to variations in the ice viscosity directly induced by grain size variations, or other intrinsic effects.

It is worth noting that axial tension strain along the core is imposed at the core scale, whereas simple shear stress is locally imposed by the slope of the ice sheet. The anisotropic viscosity of such ice could explain layer thinning variations and folding-like behavior as assumed between stages 11 and 12 at Vostok [Raynaud et al. , 2005].

These data are analyzed taking into account impurity content variations and isotopic measurement along the core. Presented results have to be analyzed regarding layer thinning along these five climatic stages with emphasis on dating purpose.

Raynaud et al. (2005). Revisiting the Vostok record: the CO₂ paradox of marine isotopic stage 11. Nature 436, 39-40.