

## MECHANICAL PROPERTIES OF ANTARCTIC DEEP CORE ICE

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### ABSTRACT

*Tensile tests were carried out with Antarctic deep core ice obtained at Byrd Station in 1968. Specimens for the tests were so prepared as to have their long axes parallel, perpendicular and inclined  $45^{\circ}$  with respect to the axis of core, or to the vertical direction of the ice sheet. Stress-strain relationships were recorded with different strain-rate and also at different temperatures.*

*The stress-strain curve generally exhibited a type of stress-saturation without any yield drop which was a characteristic feature in the case of easy glide in single crystals. This saturated value of the stress was considered as the maximum stress or the yield value. The relationship between the strain-rate  $\dot{\epsilon}$  and the maximum stress  $\sigma_{max}$  was expressed as*

$$\dot{\epsilon} = A \sigma_{max}^n$$

*The number of the exponent n was approximately 2, a little larger than that in the case of single crystals but smaller than those obtained for polycrystalline ice crystals hitherto obtained. The stress level which is designated by A in the equation above varied with the orientation of specimens, especially when the fabric diagram of specimens showed strong preferred orientations.*

*The experimental results are well interpreted by feasibility of the basal glides in polycrystalline aggregates with respect to the preferred orientations in ice specimens.*