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Venue: Zoom

A link will be sent @grc-all within 30 minutes before the beginning of the seminar.

Crystallographic-preferred orientation and microstructure of deformed $MnGeO_3$ perovskite

We conducted high-pressure and high-temperature deformation experiments on $MnGeO_3$-perovskite (pv), which is an analog material of bridgmanite, using D111-type deformation apparatus, and determined its deformation-induced crystallographic preferred orientation (CPO). Shear deformed samples consistently showed CPO pattern with [010] aligned parallel to shear direction, and [100] and [001] weakly aligned sub-parallel to shear plane normal. Uniaxially compressed and extended samples showed alignment of [100] and [010], respectively, along the deformation axes. Based on microstructural observation using TEM, presence of dislocations with b = [010] and [001] and {110} twins in $MnGeO_3$-pv were confirmed. Therefore, observed CPO in $MnGeO_3$-pv is reasonably explained by activity of [010](100) dislocation glide and/or {110} deformation twinning during deformation. Flow direction at around the 660 km discontinuity is one of the key to understand the flow pattern of the whole mantle. The CPO observed in this study yields seismic anisotropy similar to that calculated by Tsujino et al. (2016) based on deformation-induced CPO of $(Mg,Fe)SiO_3$ bridgmanite. This suggests predominance of horizontal flow near subducting slab at the uppermost lower mantle.