

Effects of hydrogen bond symmetrization on the elastic properties of hydrous minerals under high pressure

Jun Tsuchiya[1]; Taku Tsuchiya[2]

[1] GRC, Ehime University; [2] GRC, Ehime Univ

It has been believed that water is transported into the deep mantle by hydrous minerals in subducting cold slabs. Existence of water in deep Earth minerals is known to affect their viscosity, melting temperature, and elastic properties. We have found using first principles techniques that both of phase D and delta-AlOOH, which are relevant to the carrier of water into the lower mantle, change to have the symmetric hydrogen bond at lower mantle pressures. Here we report the effects of hydrogen bond symmetrization on the elastic properties of phase D and delta-AlOOH and discuss seismic signatures expected to occur associated with the hydrogen bond symmetrization.