

Deep dry cold slab beneath southwestern Japan, and more...

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The receiver function analysis of the subducting Pacific plate beneath southwestern Japan successfully shows, for the first time, a direct image of the postulated meta-stable olivine wedge (MOW; Iidaka and Suetsugu, 1992, *Nature*) inside of the slab below a depth of 350km. We observe both velocity decrease (from shallow to deep) and increase corresponding respectively to the upper and lower edge of the MOW which is expected to have several percent slower seismic velocity relative to the surrounding normal slab (Kaneshima et al., 2007, *EPSL*). The catalogue seismicity by JMA indicates that deep earthquakes are located along the lower edge of the MOW. The detailed investigation of the relative locations of these features in progress should give a tight constraint on the origin of deep earthquakes.

The existence of the MOW indicates insignificant amount of water present in the subducting slab in the region (Hosoya et al., 2005, *GRL*, Yoshioka and Torii, 2008); together with the observed deep depression (~40km) of the 660-km discontinuity in the same area, the effective Clapeyron slope of dry slab for the 660km discontinuity should be significantly steeper than those predicted by recent high-pressure experiments (e.g., Katsura et al., 2003, *PEPI*).