

# Seismological investigation of the metastable olivine wedge in the subducting Pacific slab

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Deep earthquakes in the Earth occur in subducting oceanic slabs at depths of 330 km to 690 km. A possible explanation of the generation of deep earthquakes is a transformational faulting associated with the existence of metastable olivine wedge inside the slab. Although theoretical studies predict the existence of the metastable olivine, few seismological observations for it have been made so far.

The broadband seismic array in Japan (F-net) is used in this work to probe the detailed structure of the subducting Pacific slab under the Izu-Ogasawara region. Seismic records of one earthquake recorded in western Japan show clear postcursors to the direct P wave, which can be interpreted as S-P converted phases at the upper surface of the slab and discontinuity within the slab. The latter is considered to be the upper boundary of the metastable olivine wedge.