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# Effects of fluids dehydrated from subducting oceanic crust on earthquakes and slow slips in Tokai, Japan

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Episodic slow slips and non-volcanic tremors have been widely detected near the down-dip limit of megathrust earthquakes around the Circumstance Pacific subduction zones. Although the ETS is generally supposed to be attributed to high pressurized fluids, the geological origin of the high fluid pressures in the ETS area has not been figured out in terms of the dehydration metamorphic reactions of the oceanic crust. Here, we show that the subducting oceanic crust of the Philippine Sea plate is undergoing progressive metamorphic dehydration-reactions, based on depth changes of high-resolution seismic images. The Poisson-ratio and the degree of the low-velocity anomaly within the oceanic crust gradually increases from the shallow depths of the down-dip limit, and reaches the peak at centroid of the moment-released area by the long-term slow slip. The Poisson-ratio maintains high value showing a patchy structure at depths greater than the slow slip area, where the non-volcanic low-frequency earthquakes align along the plate interface. They are located beneath a partially serpentinized-mantle wedge corner aligning along the plate interface. The oceanic crust then shows rapid reduction of the Poisson-ratio at the greater depths accompanying with abundant intraslab seismicity, where the oceanic basalt could transform to the amphibole-elcogite phase. The slow slip was induced by the near lithostatic fluid pressures generated by an impermeable body underplated beneath the overlying plate. In contrast, the non-volcanic LFEs could be a shear slip of the mantle peridotite contact plane triggered by the locally high-fluid pressures.