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Generating process of intraplate earthquakes and roles of crustal fluids

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The generating process intraplate earthquakes has not been fully understood yet. Recently, roles of the weak zone in the lower crust are noted, since aseismic deformation of the weak zone can generate stress concentration on the seismogenic fault above it. The existence of the weak zone is estimated as low velocity and/or low resistivity anomalies in the lower crust detected by tomographic studies. Furthermore, the stress concentration that is thought to be generated by the deformation of the weak zone was detected around the seismogenic faults in Japan. The weak zone is thought to be weakened by water in the lower crust. In fact, low velocity and/or low resistivity anomalies are estimated between the weak zone and the subducting slab beneath it.

Keywords: intraplate earthquake, lower crust, stress accumulation process, Niigata-Kobe tectonic zone, crustal fluid