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Reason of rare appearance of the seismic quiescence for the crustal earthquakes in the southwestern Japan

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We have reported that seismic quiescence can be recognized at least 10 cases among 25 events in the major earthquakes with the magnitude 6.7 and larger in and around Japan since 1987 in JMA catalog by means of the AkI method (Aketagawa and Ito, 2008; Hayashimoto and Aketagawa, 2010). Dividing the above 10 successful cases by focal places, we find 6 cases among 11 events for the plate boundary earthquakes, 3 cases among 7 events for the slab earthquakes and only 1 case among 7 events for the crustal earthquakes. Dividing the above successful cases of the crustal earthquake by the focal areas, we find that there is one case among one event in the northern Japan, whereas for no case among six events in the central and south-western Japan. Why are they scarcely found in the crustal earthquakes in the southwestern Japan? For this problem, there is a possibility that seismic quiescence cannot be recognized due to different procedures and standards for detection of seismic quiescence. Actually, by applying the AkI method to the Western Tottori-Prefecture earthquake in 2000 (M7.3) with a higher level of the occurrence probability of quiescence, we can detect seismic quiescence before the earthquake (Ohta, personal communication). Therefore, there is a possibility that the cases where quiescence cannot be recognized are caused by use of inappropriate standards. The tectonics of the northern-, central- and south-western Japan are different. The focal mechanisms of the plate boundary and crustal earthquakes in the northern Japan are almost thrust-types, whereas those in the south-western Japan are almost strike-slip types. And those for the central Japan are almost thrust types with high dip angles. Since we search changes in seismic activity for horizontal area in AkI method, the standard should be appropriately changed for the earthquakes with vertical or nearly vertical fault planes.

Keywords: Seismic Activity, Quiescence, Earthquake Prediction