AOGS 2005

Global Seismic Activity and Implications of Recent Seismicity Patterns

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We examined global seismic activity for the period 1900-present to understand seismicity patterns associated with the December 26, 2004 Sumatra earthquake of *Mw*=9.0. Among the five largest *Mw* ≥9.0 earthquakes that occurred during 1900-2004, the 2004 Sumatra earthquake is unique in the point that it occurred in low-latitude region in the Indian ocean after the interval of 40 years since the previous four *Mw* ≥9.0 earthquakes which clustered between 1952-1964 around the circum-Pacific belt (Figure 1). A close examination of time-space plot of large earthquakes with *Mw*≥7.7 around the 2004 Sumatra earthquake shows an active seismic period started from the beginning of 1990's along the Philippines, New Guinea and Bismarck islands. Then noticeable events occurred in 2000 and 2001 around the locus of 2004 Sumatra earthquake. They include 2000/6/4 *Mw*7.9 along the Sunda-Australia plate boundary, 2000/6/18 *Mw*7.9 within the Australia plate, 2001/1/26 *Mw*7.7 within the Indian plate and 2001/11/14 *Mw*7.8 within the Eurasian plate. These seismicity patterns suggest the Indian-Eurasia plate boundary zone enters into a new active period. Mogi (1974) pointed out the simultaneous and successive occurrence of large earthquakes in the last active period along the Alpide seismic belt which terminated in mid 1950's. It is important to pay attention to the currently quiescent region along the Indian-Eurasia collision zone.

Keywords: Seismicity patterns; plate boundary zones; great earthquakes.

References

[1] Engdahl, E. R. and Villasenor, A., in *International Handbook of Earthquake & Engineering Seismology, **81A***, W. H. K. Lee *et al* Eds, Academic Press, 665 (2002) ; Utsu, T. , *Seismicity Studies: A Comprehensive Review*, Univ. Tokyo Press, 876pp (1999).

[2] Mogi, K., Tectonophys. **22**, 265 (1974).

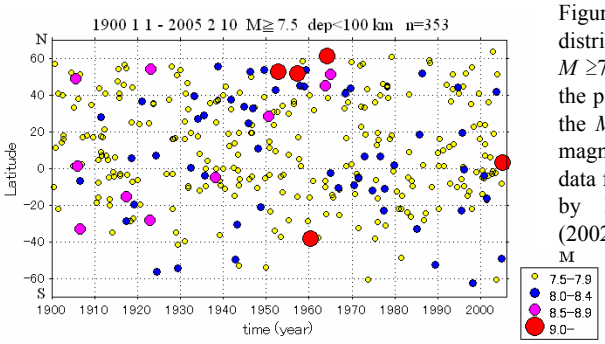

Figure 1. Space (latitude)-time distribution of earthquakes with *M* ≥7.5 and depth <100 km for the period 1900-present. Mostly the *M* is equivalent to moment magnitude *Mw*. We compiled data from earthquake catalogues by Engdahl and Villasenor (2002), Utsu (1999), and PDE data via U.S.G.S web site.