



Spatiotemporal Variation of the Korean Seismicity

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The spatiotemporal variation of the Korean seismicity is investigated using the earthquake catalog of Korea Meteorological Administration (KMA). The investigation is made applying the Chi-square algorithm by Noh (2017, submitted) which simultaneously estimates the magnitude of catalog completeness, maximum magnitude, and the Richter-b. To investigate the temporal variation, we apply the moving time window that is three-years long and shifts by one year. But little is obtained from the temporal investigation because the sub-catalogs in the majority of time windows fail the completeness test. We think this is due to several reasons such as the inconsistent magnitude scale, continuous improvement of the seismic network, and the low seismicity. To investigate the spatial variation, we divide the KMA catalog into three sub-catalogs composed of the earthquakes occurred in the off-shore (O), in North Korea (N), and in the land of South Korea (SL). The division is based on the consideration that the earthquake reports for the land of South Korea are more complete than those for the off-shore or the North Korea region. Investigation is made not only for these three sub-catalogs but also for two of their combinations; SL+O and SL+O+N. First of all, the estimates of magnitude of catalog completeness are very high. We think this is due to the integration of temporally inconsistent earthquake catalogs without proper corrections. As expected, the catalogs for the off-shore events (O) or northern events (N) are less complete than that for the southern land events (SL). It is interesting that the combined sub-catalogs are much less complete than the original sub-catalogs. The estimate of the Richter-b is smaller for the off-shore events because smaller events are missing more away from the coast. The same situation is expected for the northern events, but the result is not. We conjecture this is partly due to the inclusion of artificial events.