

Determination of broadband moment magnitudes for earthquakes in and around Philippines, Pakistan, and Papua New Guinea

Tatsuhiko Hara[1]; Joan L. Cruz-Salcedo[2]; Ameer Hyder[3]; Mathew Moihoi[4]

[1] IISEE, BRI; [2] PHIVOLCS; [3] PMD; [4] GSPNG

We determine broadband moment magnitude M_{wp} for earthquakes that happened in and around Philippines, Pakistan, and Papua New Guinea using data from a few broadband seismic stations. M_{wp} was developed by Tsuboi et al. (1995, 1999). They integrated broadband velocity records twice to determine this magnitude scale. We slightly modified their procedure to obtain M_{wp} more stably. First, we integrate velocity records to obtain displacements. For the second integration, following Yoshida and Yokota (1994), who determined magnitudes using amplitude data from accelerometers, we adopt the level cross method with slight modification. Instead of using a fixed cross level, we change the cross level to obtain the optimal estimate of seismic moment. Our approach can avoid choosing initial small peaks in integrated displacement records effectively. We apply this procedure to determination of M_{wp} for earthquakes in and around Philippines, Pakistan, and Papua New Guinea. We compare our estimates to M_w in the Harvard catalog to find a good correlation between them. We also find that our estimates better correlate with Harvard M_w than M_{wp} obtained following the original approach for the applications in Philippines and Papua New Guinea.