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## Do weak motion models predict strong ground motion? Results from the Kiknet records analysis

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An important question that arises in regions of low or moderate seismicity is the degree to which models derived from weak motion data can be used for strong motion prediction. Recents results have suggested that stress drops and geometrical spreading could scale with magnitude. These results imply that weak motions models could underestimate the ground motions of larger earthquakes, which favors the rejection of such models for seismic hazard analysis. In order to study this hypothesis, borehole records of the Kik-net (Japan) network have been selected. These accelerograms are collected between 1998 and 2004 and correspond to shallow events with depths less than 25 km. These records are in principle not affected by nonlinear site response because the downhole sensors are located at 100 m depth on rock formation. Ground motions of 297 earthquakes of magnitude between 4.0 and 5.0 have been used to derive a "weak motion" empirical ground motion model (2194 records). The same two step inversion method has been used to derive a "strong motion" empirical model based on 38 earthquakes of magnitude greater than 5.0 and less than 7.3 (1666 waveforms). In this way, the pitfalls of extrapolating ground motion models from small to large magnitude earthquakes are discussed and illustrated for the selected target region.