



Repeatable path effect on ground-motion variability at a single station from Taiwan

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This paper presents the path component of error can be directly evaluated from the ground-motion estimates for future earthquake events by the new approach, Path Diagram. We use 150 shallow earthquakes (about 19,887 records) which moment magnitudes are greater than 4.0 from the Taiwan Strong-Motion Instrumentation Program network to set up the Taiwan Ground-motion prediction equations for PGA and SA. The intra-record residuals are divided into small brackets of rose diagram for four station-to-event distance bins and eight station-to-event azimuth bins to estimate the mean residuals for each path bin; hence, we can obtain a repeatable path-term and aleatory residuals for each station. Results show that this new method can catch more path effect than semi-variogram and closeness index (CI) methods, it means, if we use this approach to separate the record-to-record variability, the minimum remaining unexplained intra-event variability will get. Finally, we use the distribution map of path-to-path sigma for each station to analyze different regions in Taiwan.