



Ground Motion Predictive Equations And Its Applicability In North-Eastern Indian Region: A Critical Ap- Praisal

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Abstract

The level of ground shaking, to which earthquake-resistant structures are subjected, is estimated using Ground Motion Prediction Equation (GMPE) in terms of ground motion parameters. More than 1000 GMPEs worldwide and more than 50 GMPEs for India are available to estimate ground motion parameters like PGA, PGV, PGD, spectral acceleration, etc. However, the selection of a GMPE for seismic hazard analysis, out of available ground motion models becomes a critical task for seismic hazard analysis. In the present study, the GMPEs were selected for the Northeast region of India according to qualitative analysis and then ranked to those GMPEs for their suitability using the quantitative information-theoretic approach, based on the estimation of the Log-Likelihood value. Further, the ranking of models for discrete ranges of distance was estimated considering respective weights for the Northeast region. Based on the variable performance of models, for the different range of data, it has been observed that NDMA (2010) and Bajaj and Anbazhagan (2019) are the best-suited model for the study area. However, the weighted ground motion models have shown the efficiency and robustness in the process of selecting and ranking GMPEs for diverse applications, particularly for the Northeast Indian region, which has witnessed some devastating earthquakes in past and is vulnerable as per seismic hazard analysis.

Keywords: Ground motion, GMPE, PGA, LLH