

Characteristics of Strong Ground Motion Originated in Sumatra Determined Using Peak Ground Acceleration and Velocity: A case study for Malaysia

○Sherliza ZAINI SOORIA, Sumio SAWADA, Hiroyuki GOTO

1 Introduction

Malaysia is located on the low seismicity zone and has been exposed to the hazard resulting from distant earthquakes originating from Sumatra. Thus, structural assessment and seismic design in Malaysia have been of considerable concern in recent years.

2 Objective

The aim of the study is to establish the characteristics of distant strong ground motions by means of peak ground acceleration (PGA) and velocity (PGV).

3 Methodology and attenuation relationship

The methodology employed is as illustrated in Figure 1. Only horizontal components of ground motions were considered whereby records have been band-pass filtered between 0.1 and 50Hz for PGA, while PGV is obtained by integrating the accelerograms. Four attenuation models were selected to represent the existing ground motions, namely the Atkinson and Boore (1995), Toro *et al.* (1997), Dahle *et al.* (1990) and Si and Midorikawa (1999) models.

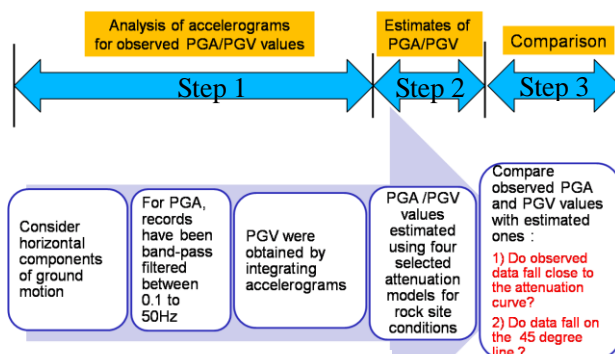


Figure 1 Methodology of study

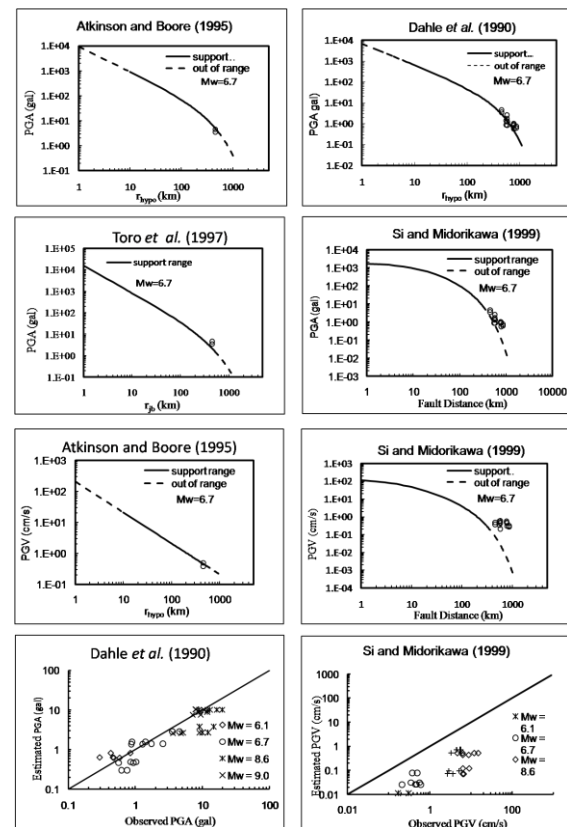
4 Data

Records of strong ground motions at fourteen seismic stations between May 2004 and the July 2007 were

employed in the study. Approximately 46 accelerograms, which were recorded from fifteen interplate earthquake events in Sumatra, with moment magnitude, $M_w \geq 5$, and hypocentral depth, $h_{\text{hypo}} \leq 40$ km have been analyzed.

5 Results

Representative results are as shown below.



6 Conclusion

All attenuation models, previously derived for stable seismic regions, provided fairly good estimation of PGA values. For PGV, observed and estimated data seem to be in good agreement with each other when using Atkinson and Boore (1995) model, while the Si and Midorikawa (1999) model underestimated PGV values for earthquakes in Sumatra.