

# Strong ground motion predictions for the M6.2 Elazig-Kovancilar (Turkey) Earthquake of March 8, 2010

by  
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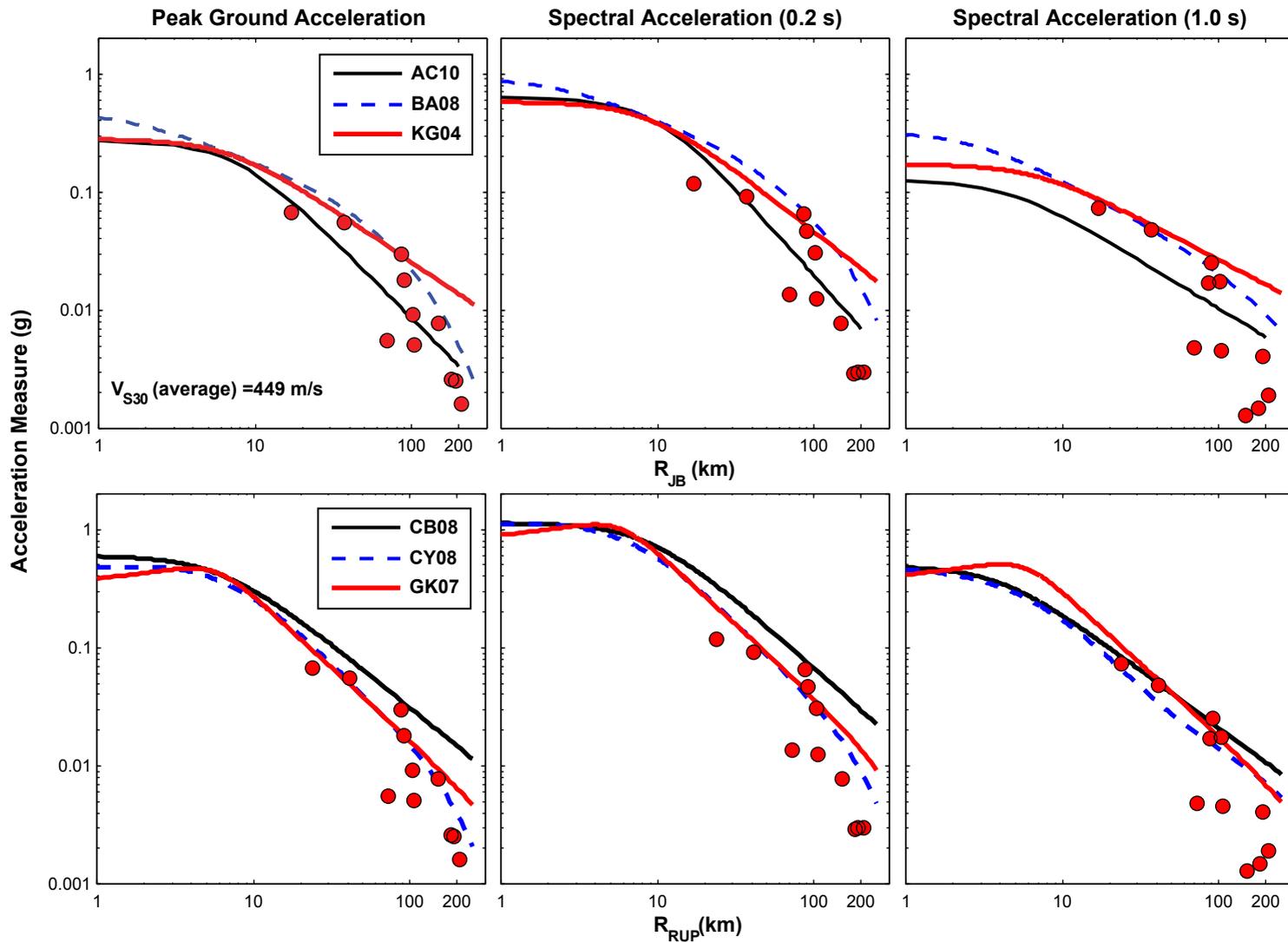


Figure 1. Comparison of PGA, SA at  $T = 0.2$  s and  $1.0$  s values from the main shock (M6.2 on strike-slip fault at 5 km depth) with six different GMPEs considering two distance measures. [Top panels] Predictions considering RJB for AC10 – Akkar and Cagnan, 2010; BA08 – Boore and Atkinson, 2008; KG04 – Kalkan and Gulkan, 2004; [Bottom panels] Predictions considering RCL for CB08 – Campbell and Bozorgnia, 2008; Chiou and Youngs, 2008; GK07 – Graizer and Kalkan, 2007, 2009. Ground motion data shows faster attenuation at far distances due to regional low  $Q$ .

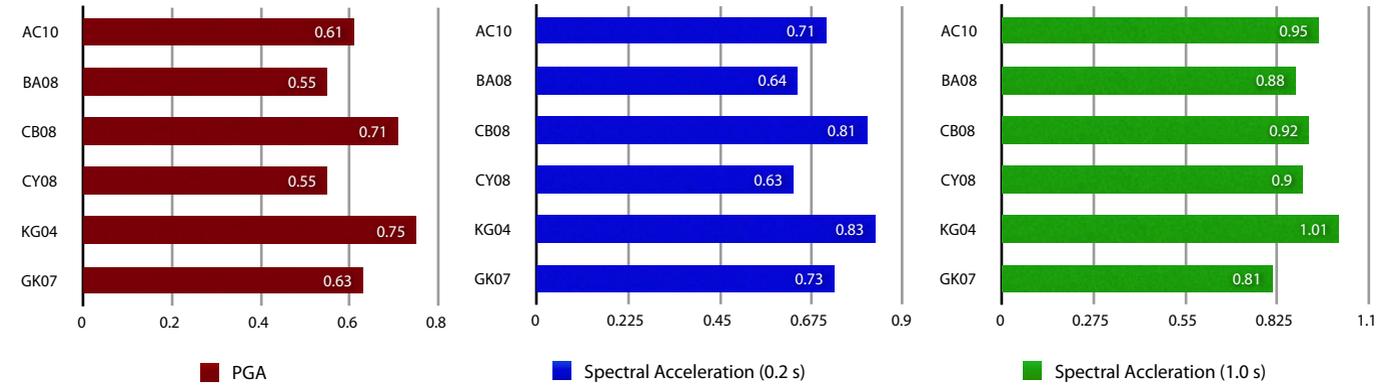


Figure 2. Standard error ( $\sigma|NY$ ) of predictions computed for each GMPE for PGA, SA ( $0.2$  s) and SA ( $1.0$  s) using maximum horizontal components from eleven ground motion records. The average standard error of six GMPEs is 0.63, 0.73 and 0.91 respectively for PGA, SA at  $0.2$  s and  $1.0$  s. In computing the standard error, exact  $VS_{30}$  values of stations were used.

Notes: (1) Maximum horizontal component is used for comparisons.  
 (2) Because the AC10, BA08, CB08 and CY08 predict geometric mean of ground motion, their predictions are adjusted for maximum horizontal component by multiplying their predictions with 1.11, 1.11 and 1.18 for PGA, SA at  $0.2$  s and  $1.0$  s, respectively.

### References:

Kalkan E. Gülkan P. "Site-Dependent Spectra Derived from Ground Motion Records in Turkey", *Earthquake Spectra*, Vol. 20, No. 4, pp. 1111-1138, 2004.

Graizer V. Kalkan E. "Ground Motion Attenuation Model for Peak Horizontal Acceleration from Shallow Crustal Earthquakes", *Earthquake Spectra*, Vol.23, No.3, pp. 585-613, 2007.

Graizer V. Kalkan E. "Prediction of Response Spectral Acceleration Ordinates based on PGA Attenuation", *Earthquake Spectra*, Vol. 25, No. 1, pp. 36 – 69, Feb. 2009.