



PRELIMINARY STUDY OF L'AQUILA EARTHQUAKE GROUND MOTION RECORDS V1.00



Eugenio Chioccarelli and Iunio Iervolino

eugenio.chioccarelli@unina.it; iunio.iervolino@unina.it

Dipartimento di Ingegneria Strutturale, Università di Napoli Federico II.

Accelerometric National Network (RAN) has made available the records of the recent earthquake with epicenter in the Abruzzo (date 6/04/09 1.32AM – UTC; Magnitude 5.8). These data were processed and compared to the Attenuation law of Sabetta and Pugliese (1996).

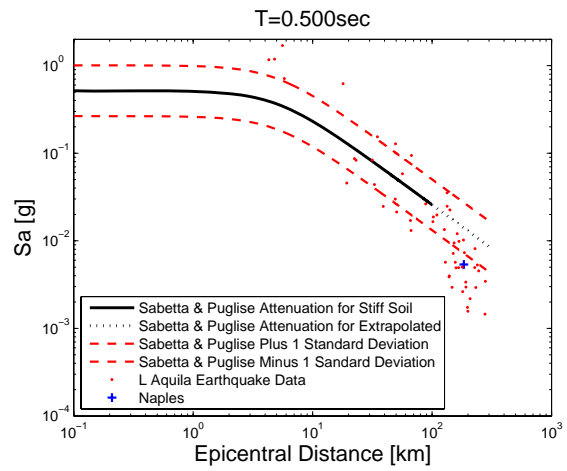
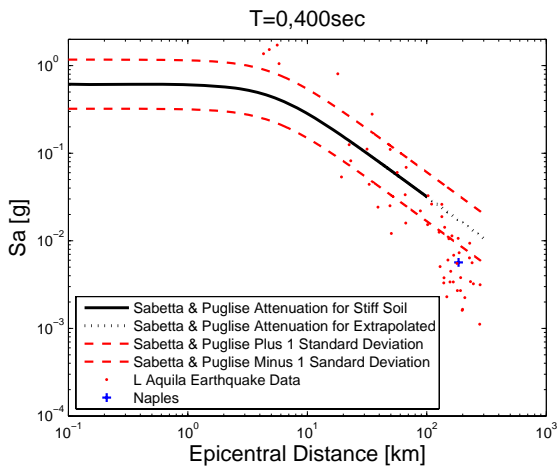
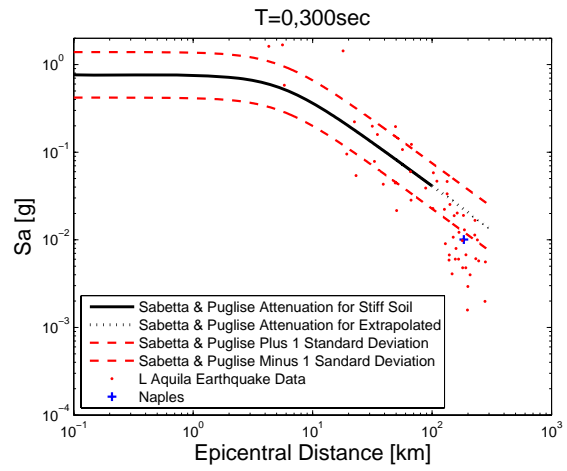
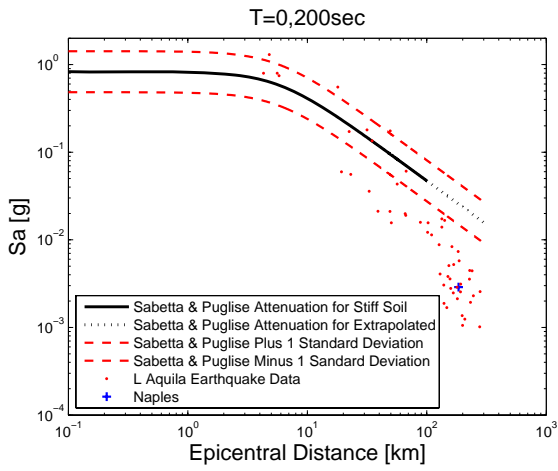
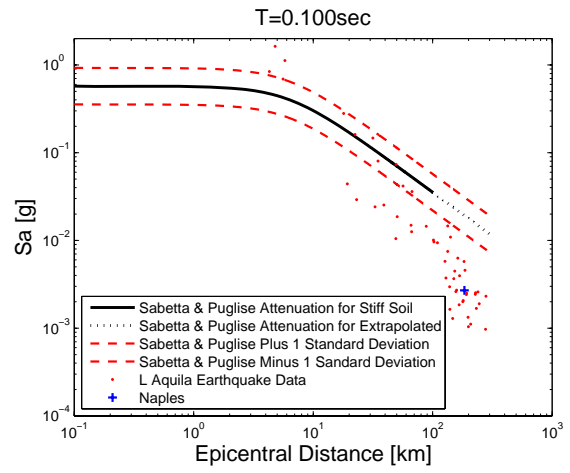
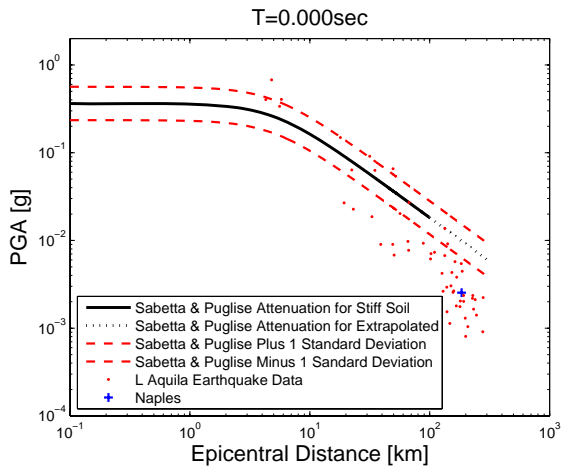
The horizontal and vertical components of the earthquake have been studied separately; each accelerometric station has produced two records of the same signal in two horizontal directions perpendicular to each other. The record chosen was characterized by the higher Peak Ground Acceleration (PGA).

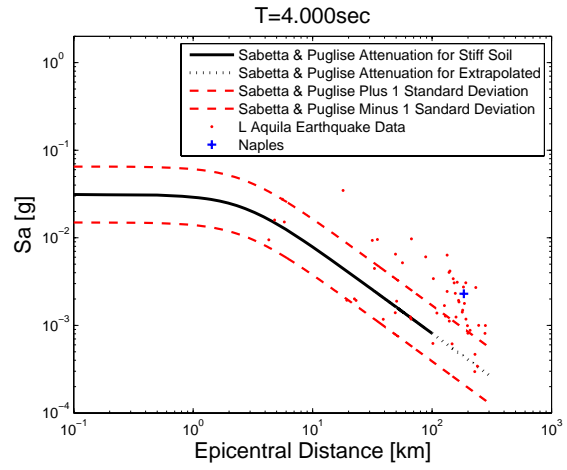
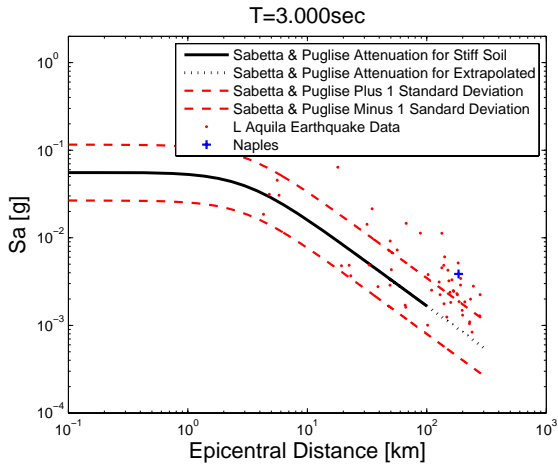
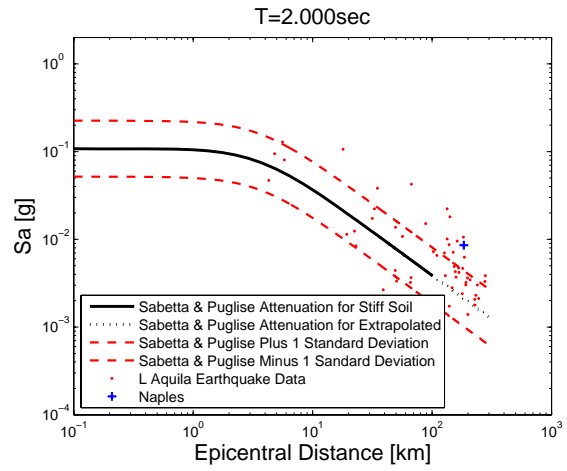
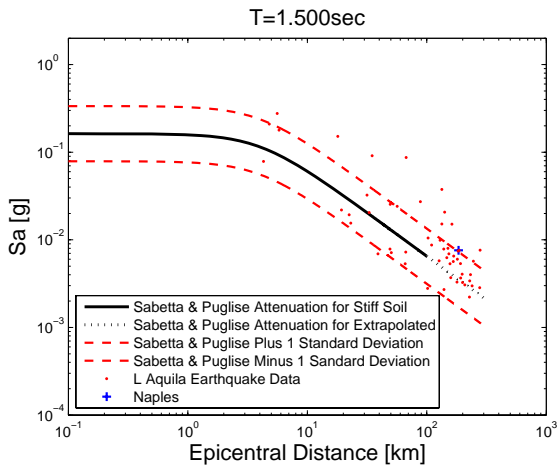
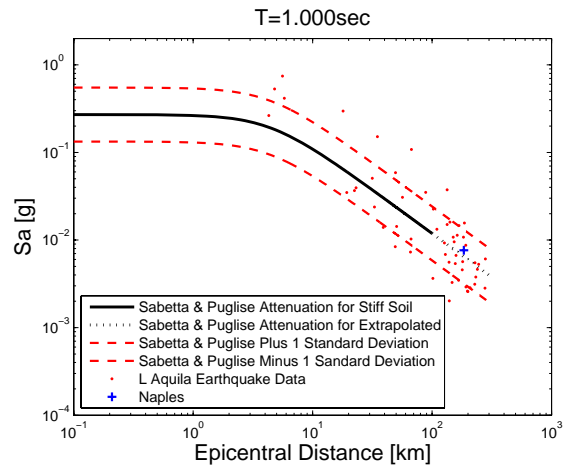
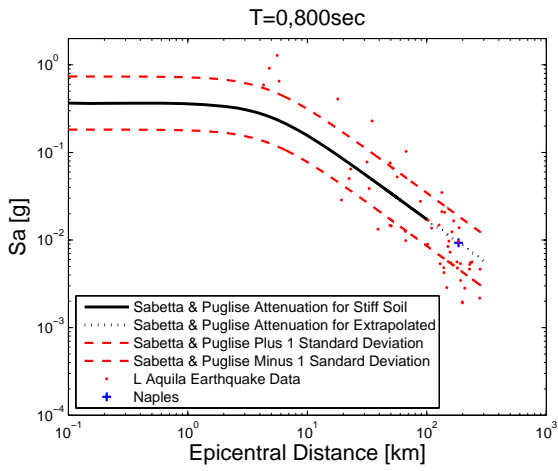
As a function of epicentral distance and for fixed spectral ordinate, the average attenuation law (and its standard deviation) were compared with the points corresponding to the values recorded at the various stations.

Furthermore, the signals recorded were grouped in bin of 10 km and the average spectrum of each bin was compared with the average spectrum obtained from the attenuation law for a distance equal to the average distance of the records of each bin.

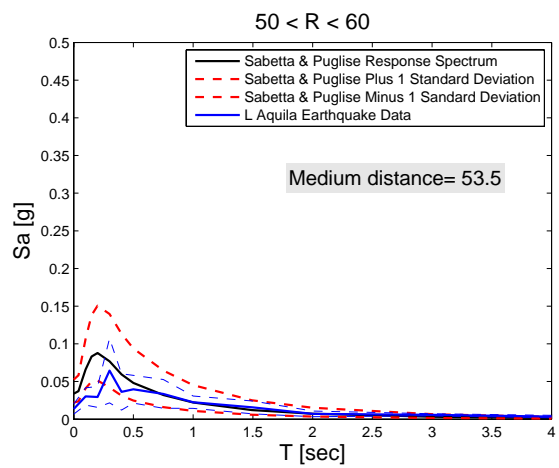
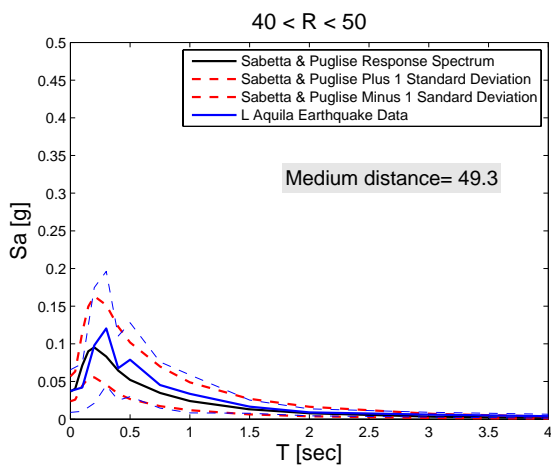
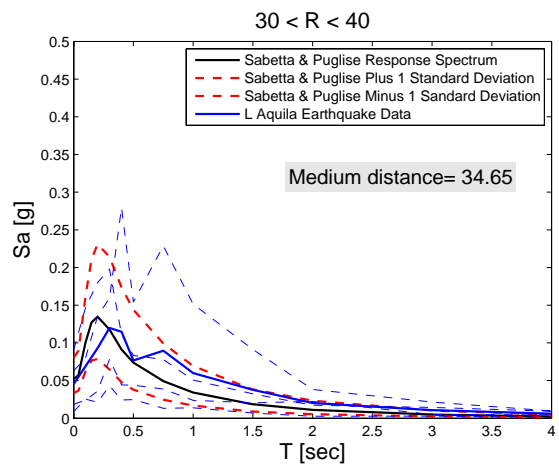
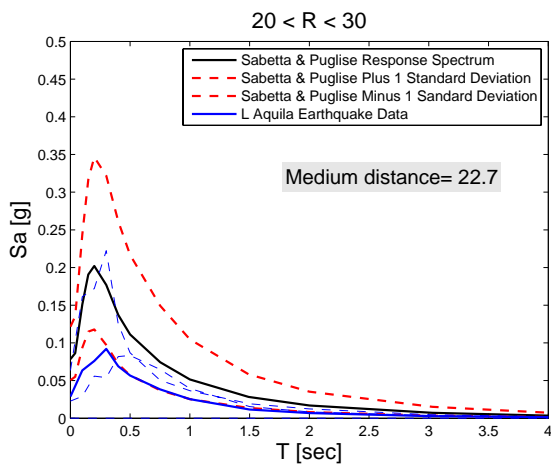
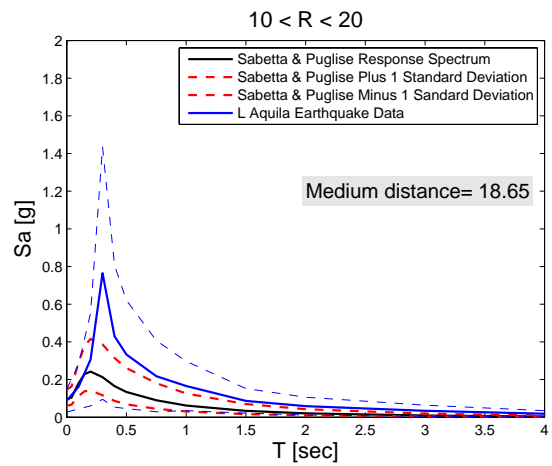
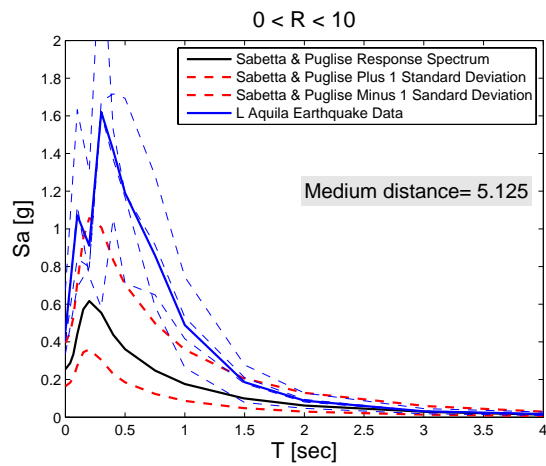
In the following are reported the results described above. It refers first to the horizontal component and after to the vertical components.

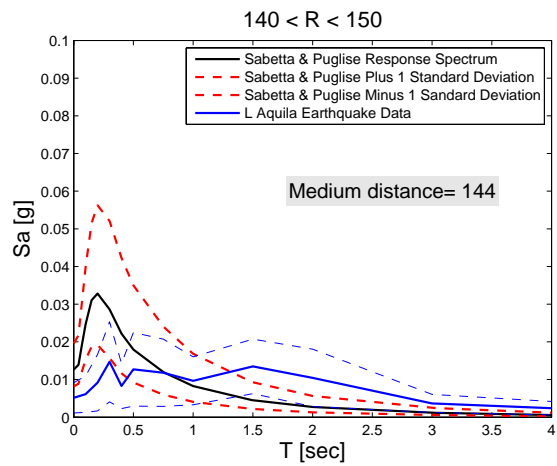
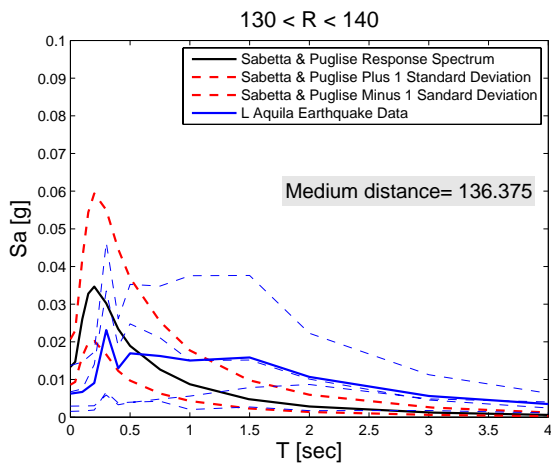
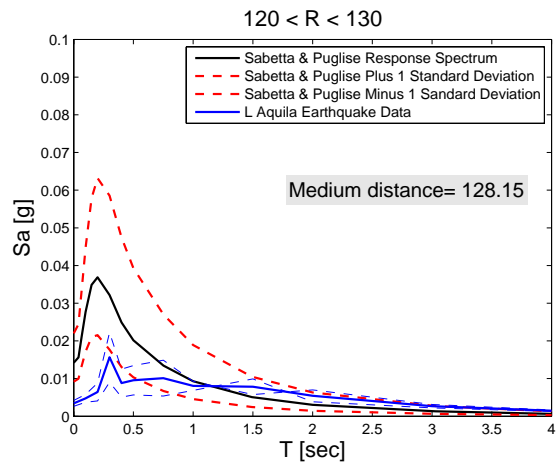
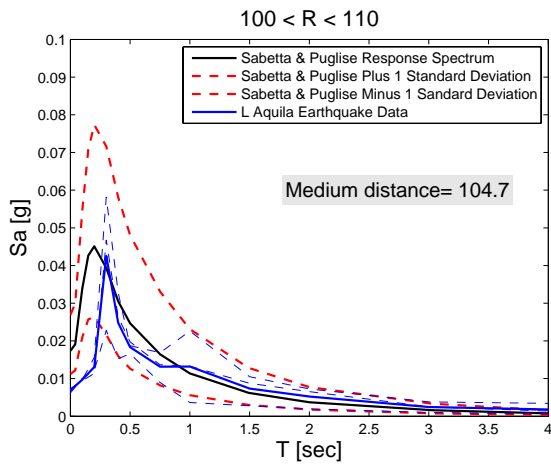
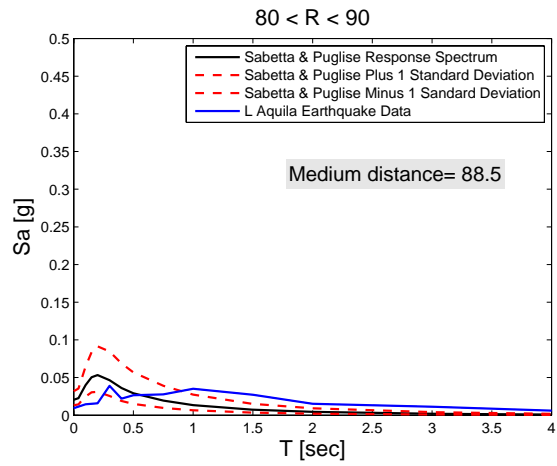
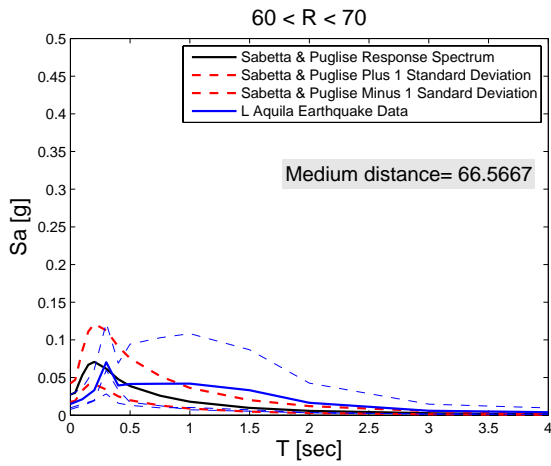
Horizontal Component - Plots for Spectral Periods

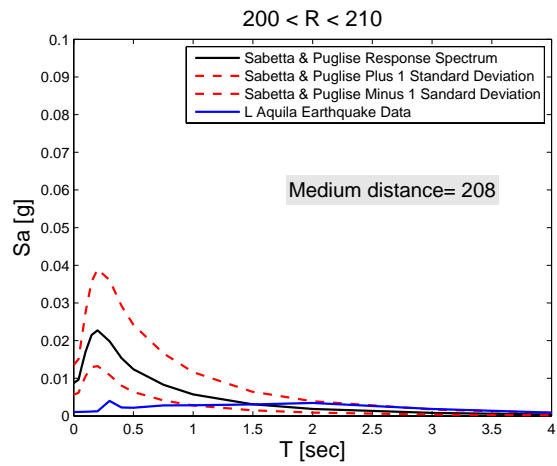
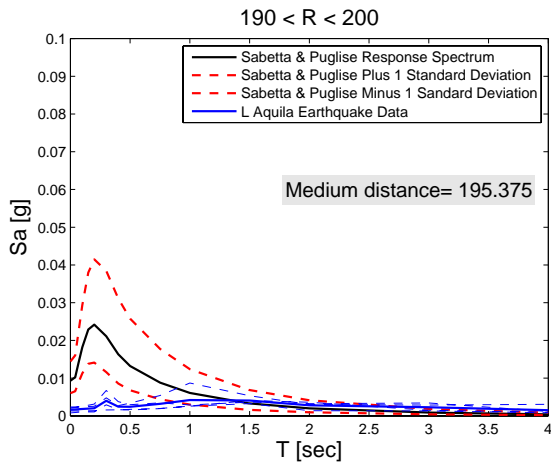
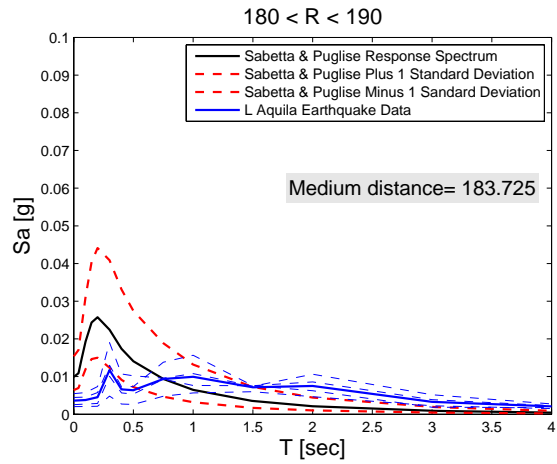
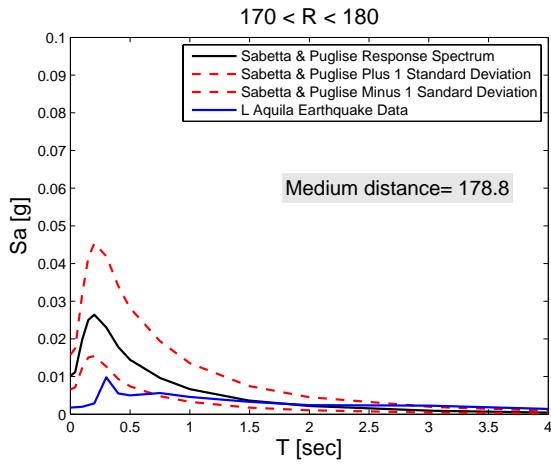
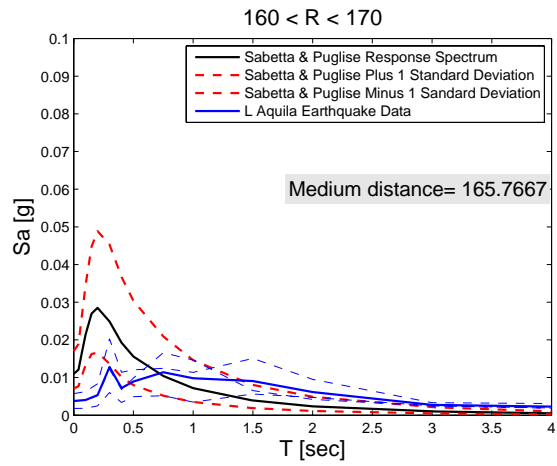
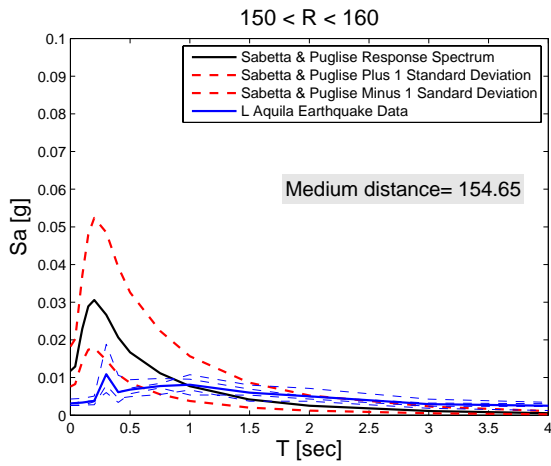


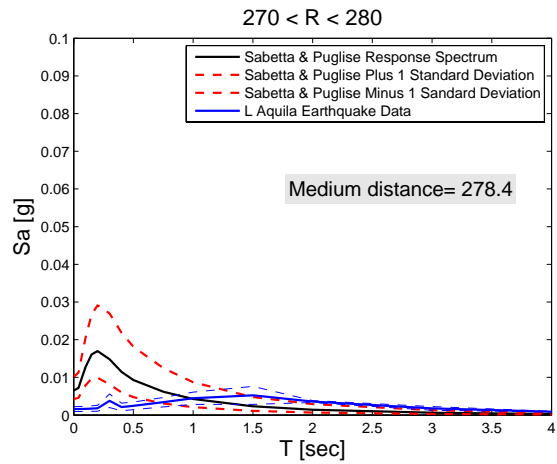
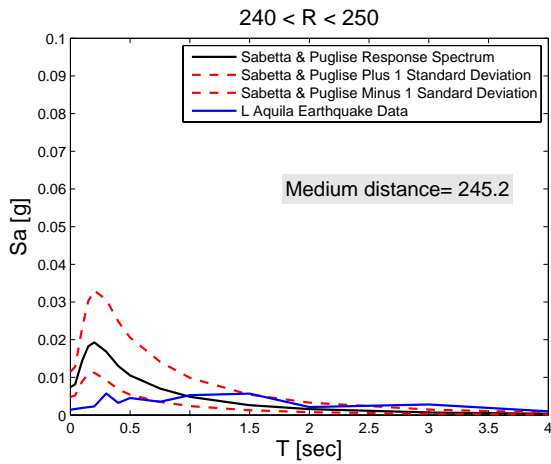
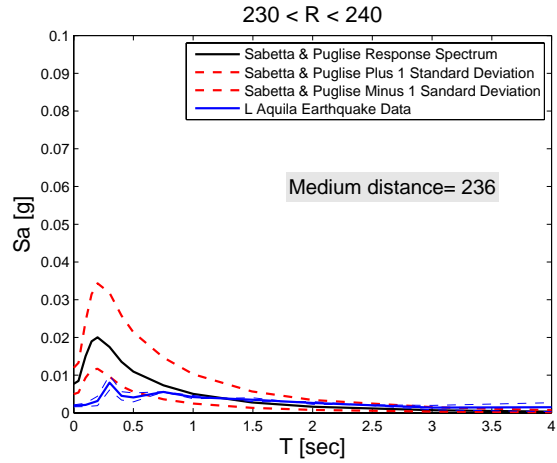
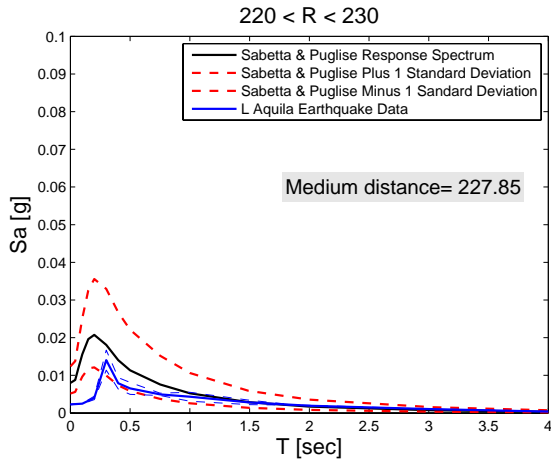


Horizontal Component - Plots for Distance Bins

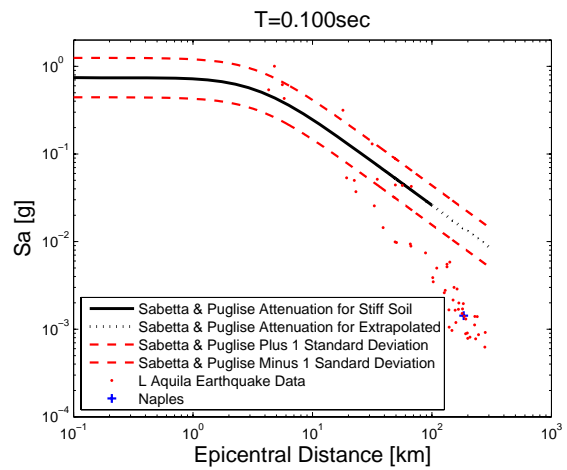
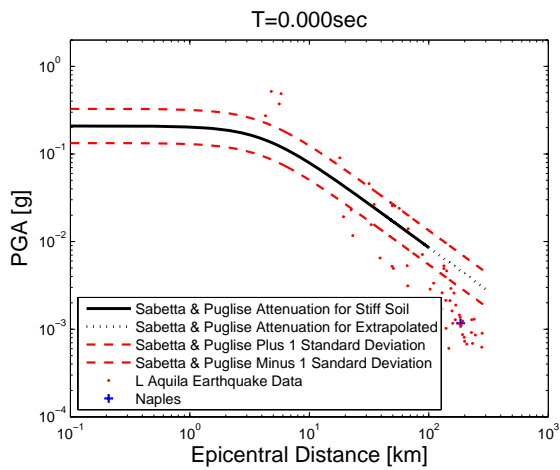


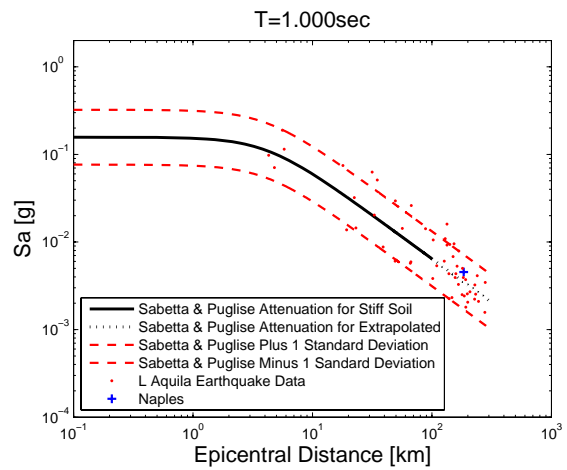
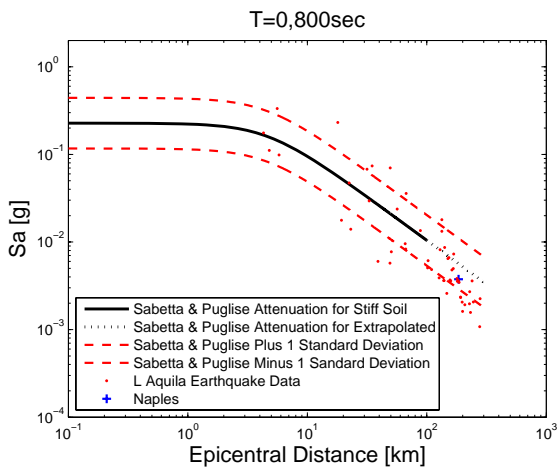
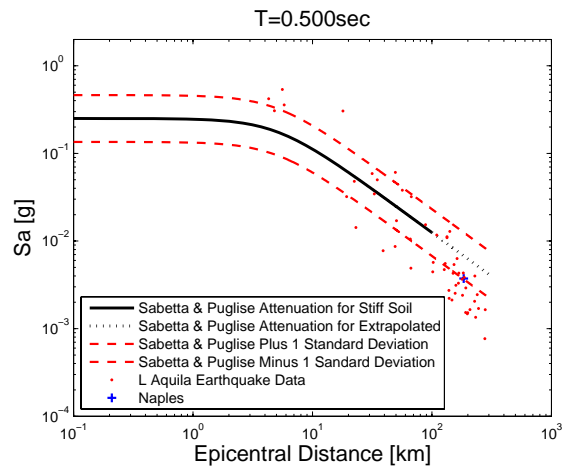
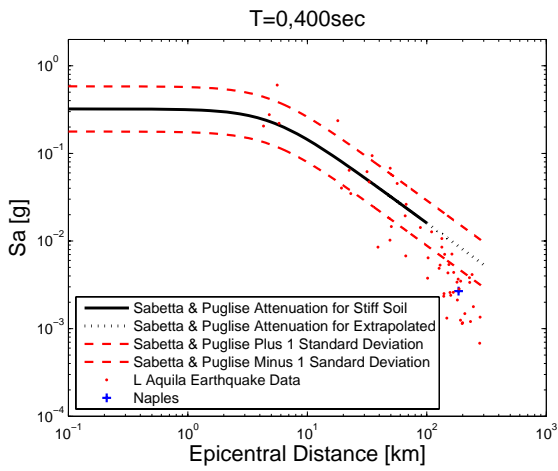
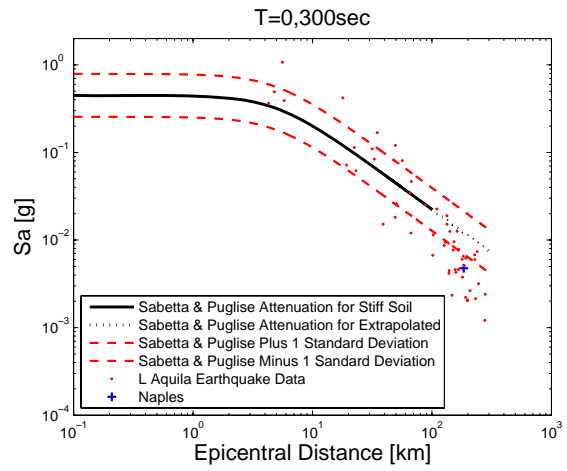
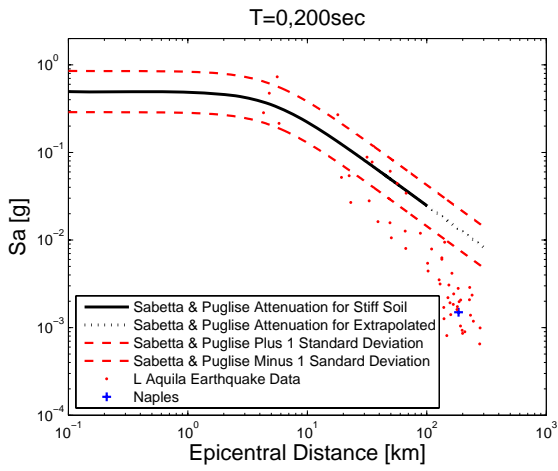


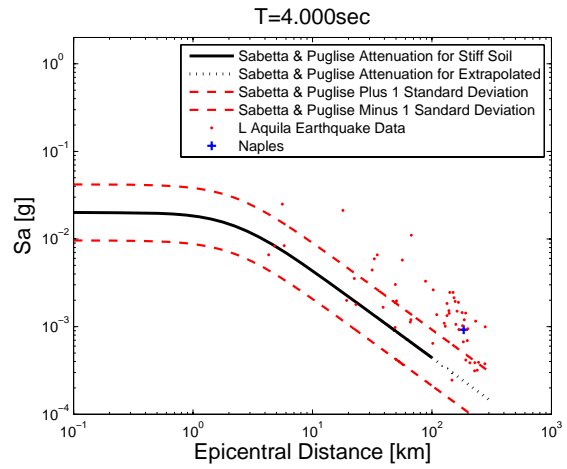
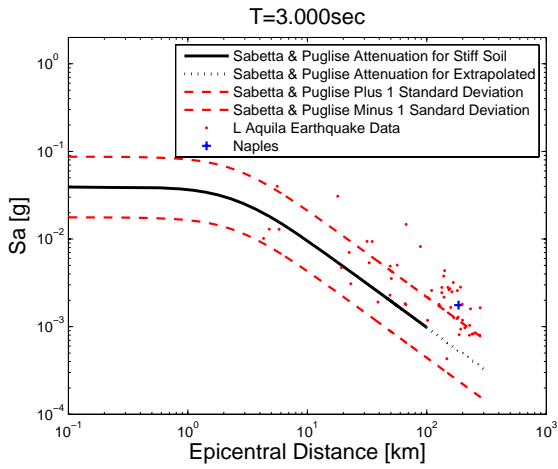
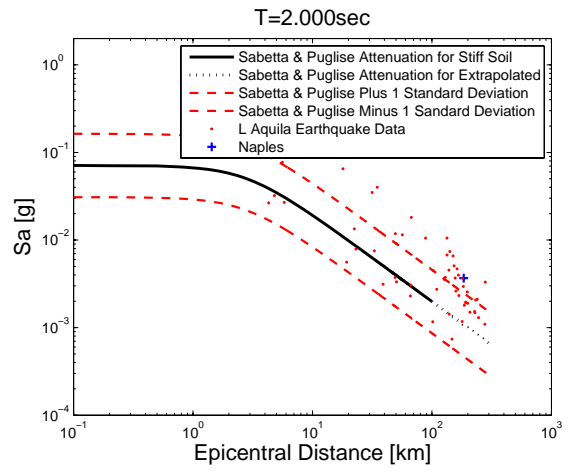
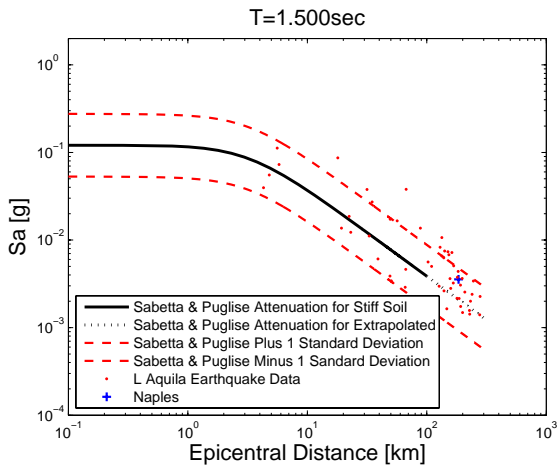




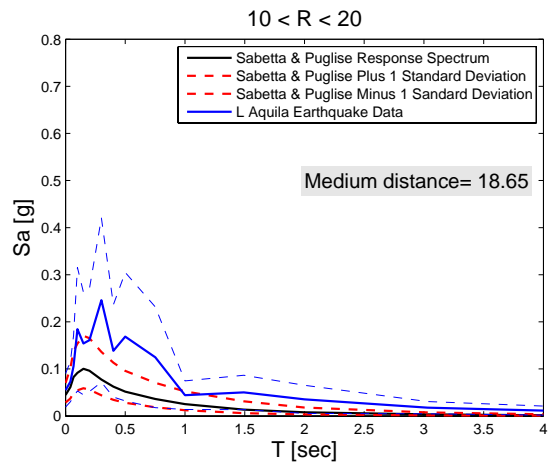
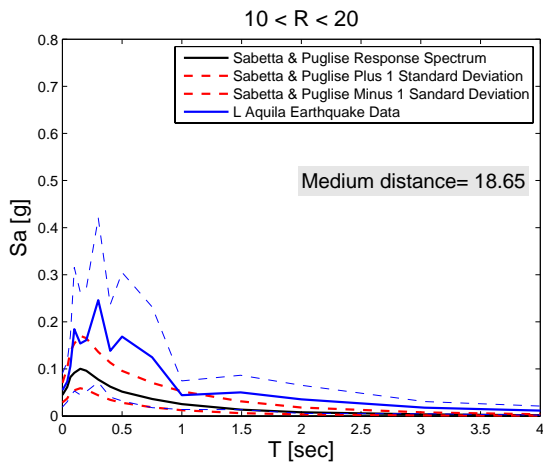
Vertical Component - Plots for Spectral Periods

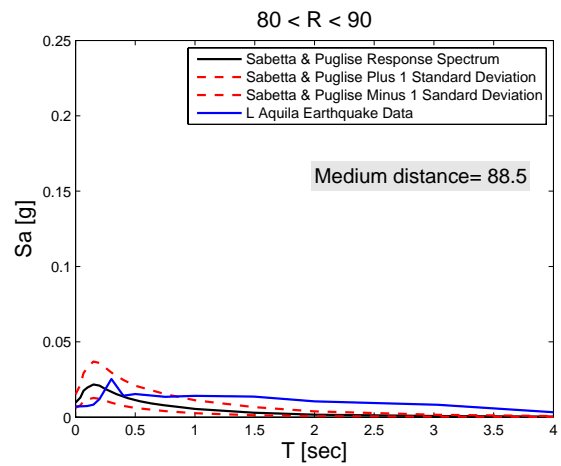
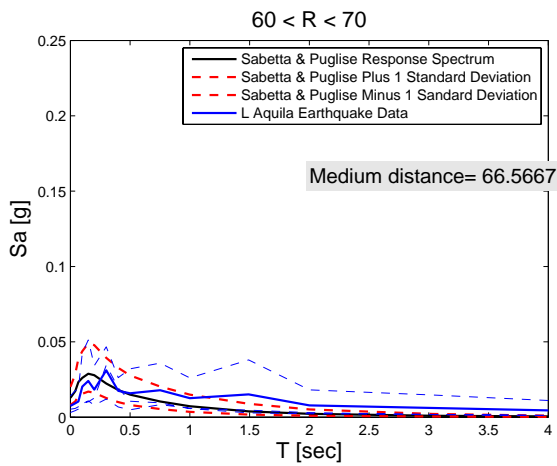
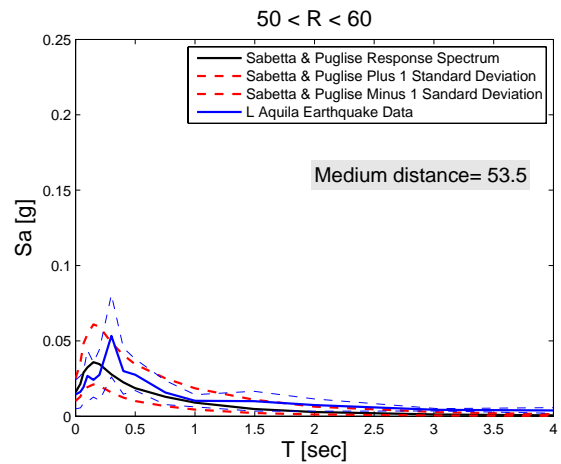
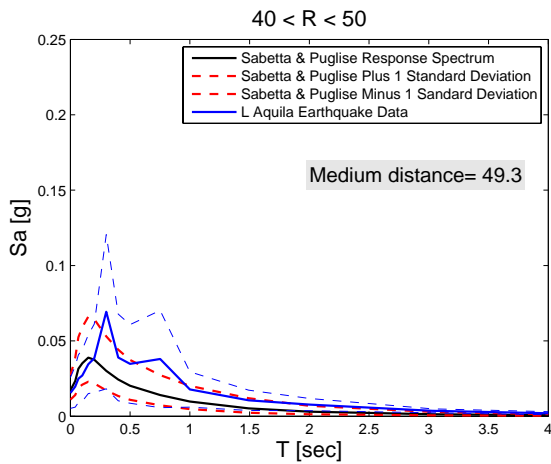
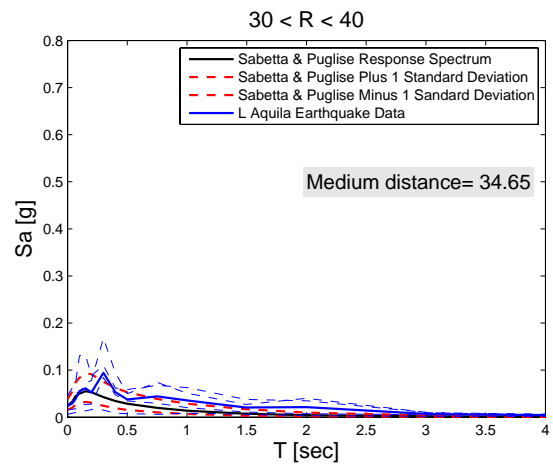
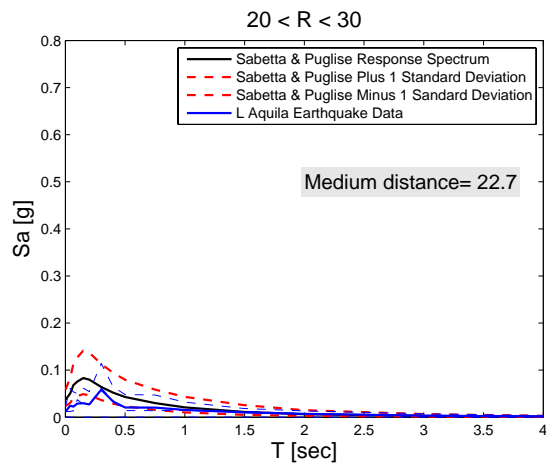


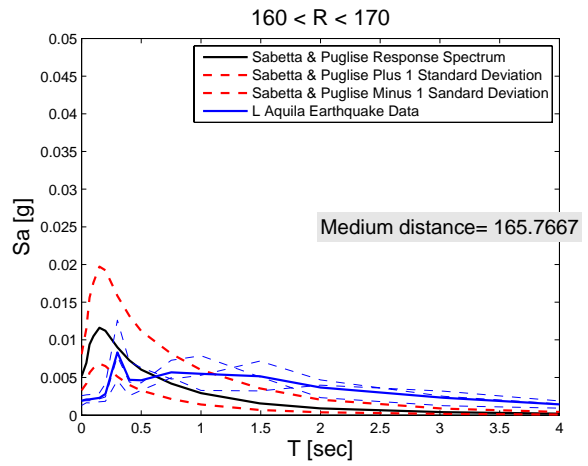
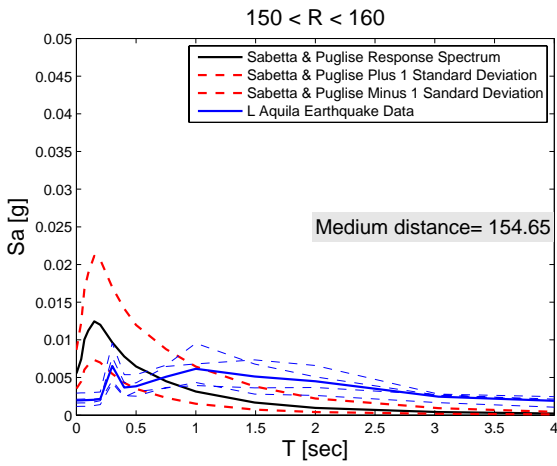
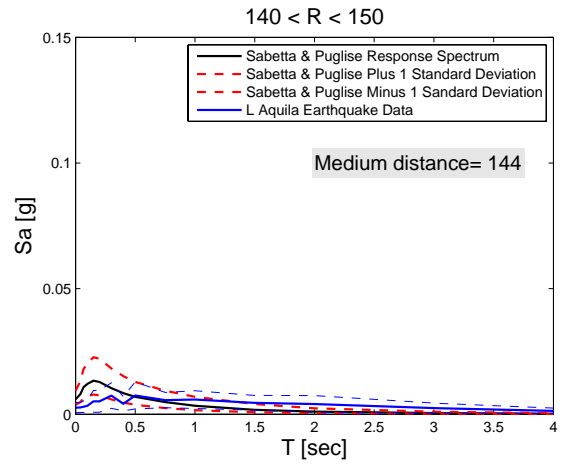
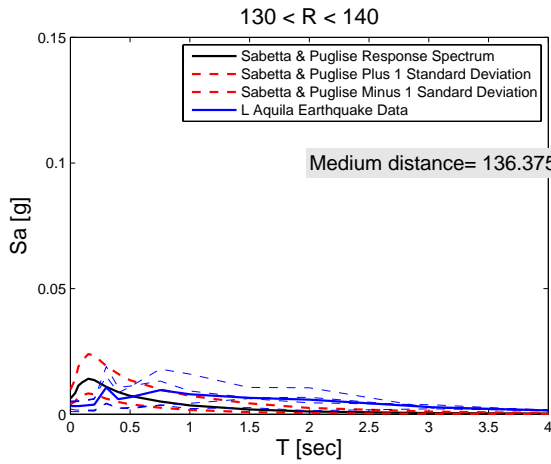
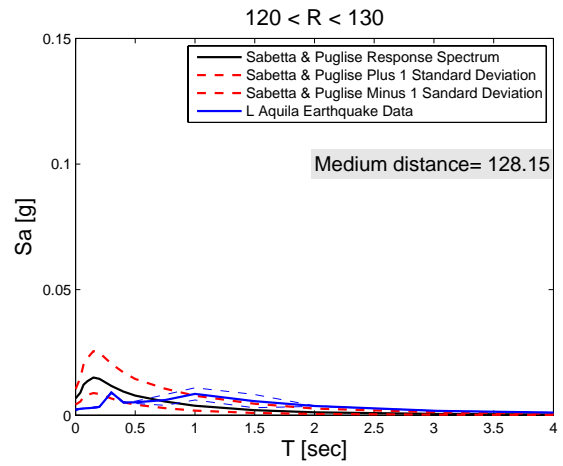
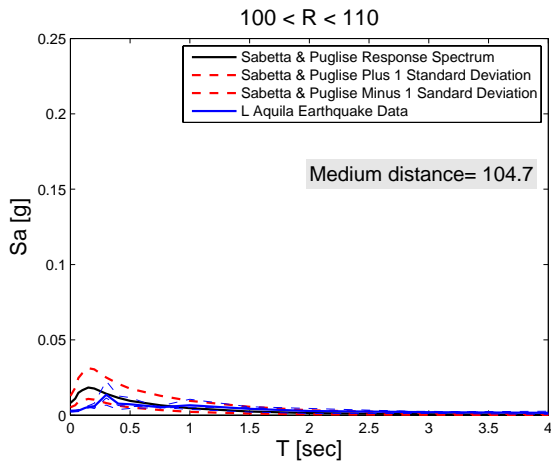


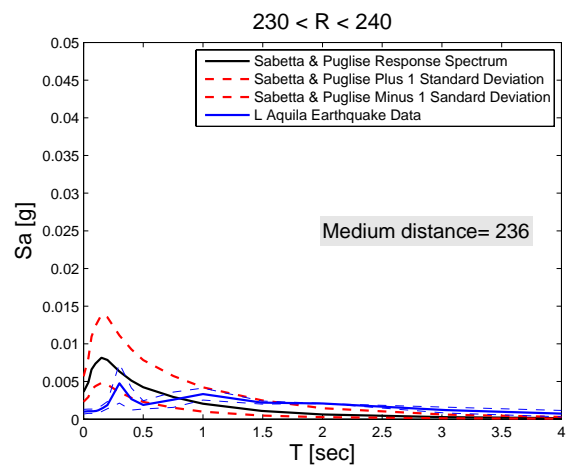
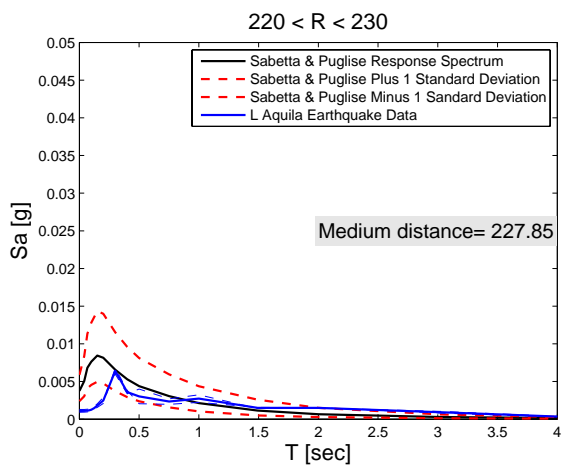
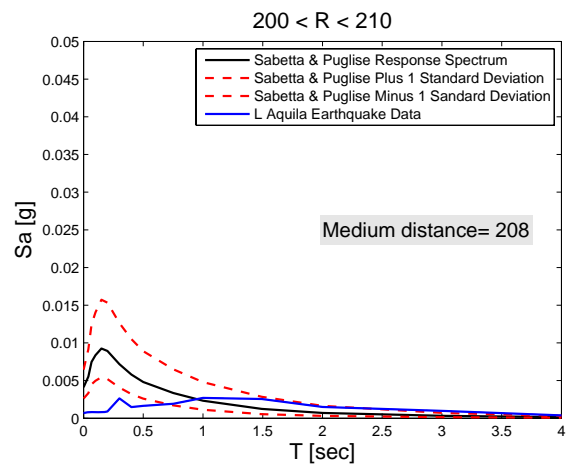
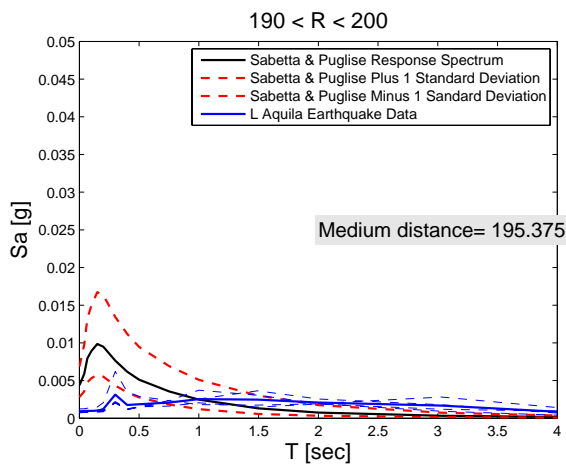
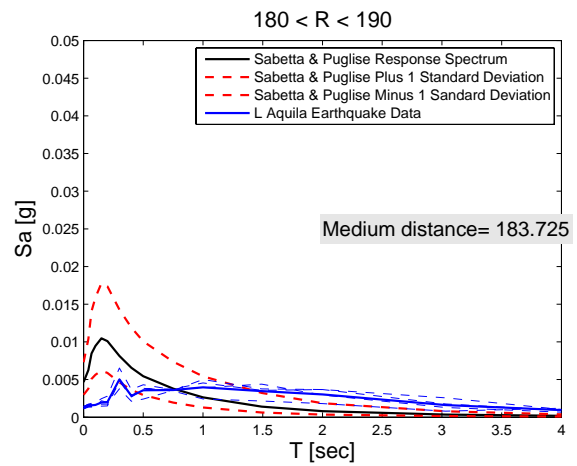
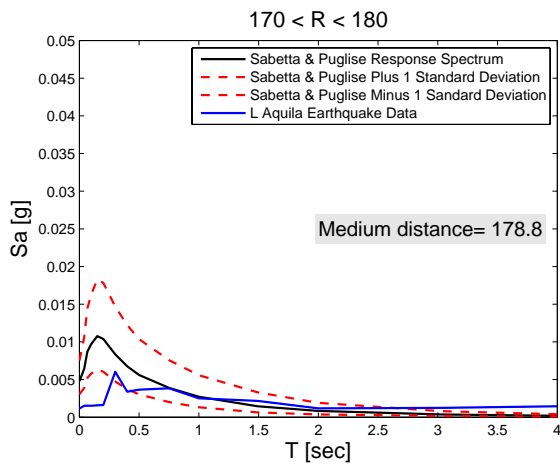


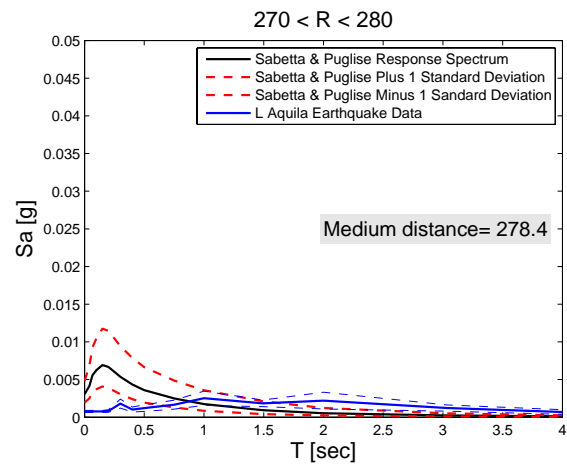
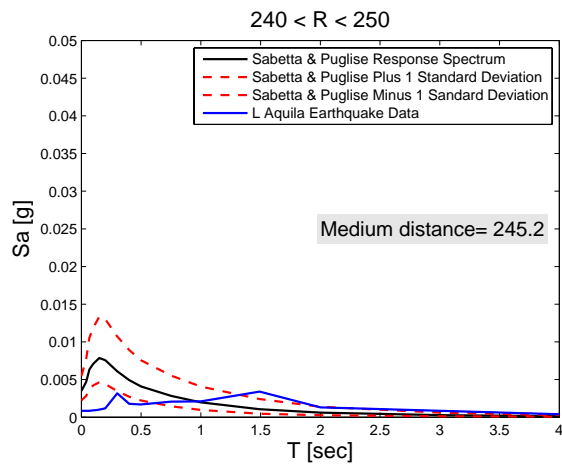
Vertical Component - Plots for Distance Bins











References

Sabetta F., Pugliese A.; 1996: Estimation of response spectra and simulation of nonstationary earthquake ground motion. *Bulletin of the Seismological Society of America*, 86, 337-352.