

**Use the left mouse button to zoom the images and to to better appreciate the results. Click on each symbol for detail about SA, residual, station-code and epicentral distance.**

**Elastic Response spectra (5% damped) - SA T=0.3s**  
**Comparison between the recorded (observed) and the predicted data**

**Left panels:** results for the geometric mean of the two horizontal components of ground motion (NS and EW); **Right panels:** results for the vertical component of ground motion (Z).

**Top panels:** *observed data* (squares) are represented with different colors in relation to the soil category of the recording site (black: A soil category of NTC18/EC8 codes; blue: B soil category of NTC18/EC8 codes; red: C soil category of NTC18/EC8 codes; gray: D soil category of NTC18/EC8 codes; green: E soil category of NTC18/EC8 codes). *Predicted data:* solid and dotted lines - indicated with the corresponding colors used for observed data - represent the median predictions and the related standard deviation ( $\pm\sigma$ ) calibrated for the Italian territory by Bindi et al. (2011).

**Bottom panels:** corresponding residuals calculated as the difference between the logarithm to the base 10 of the observed data and the logarithm to the base 10 of the predicted ones. The colors have the same meaning described for the top panels. In case of positive residuals the predicted models underestimate the recorded data, in case of negative residuals the predicted models overestimate the recorded data.

*Possible bias:*

- 1) the predicted values do not consider the contribution of the style of faulting;
- 2) the predicted values do not consider the Joyner and Boore distance (see Bindi et al., 2011 for details), but only the epicentral distance;
- 3) the predicted values are calculated considering the first available magnitude from INGV-ONT (ML or Mw) and not necessarily the Mw, used by Bindi et al. (2011) to calibrate the models.

## **References**

*Bindi D., Pacor F., Luzi L., Puglia R., Massa M., G. Ameri and R. Paolucci (2011). Ground Motion Prediction Equations Derived from the Italian Strong Motion Data Base, Bulletin of Earthquake Engineering, vol. 9, n. 6, 1899-1920.*

*Comite' Europeen de Normalisation (CEN 2003) prEN 1998-1- Eurocode 8: design of structures for earthquake resistance. Part 1: General rules, seismic actions and rules for resistance. Part 1: General rules, seismic actions and rules for buildings. Draft No 6, Doc CEN/TC250/SC8/N335, January 2003, Brussels.*

*Ministero delle Infrastrutture e dei Trasporti (NTC 2018). Aggiornamento delle Norme Tecniche per le Costruzioni. Part 3: Categorie di sottosuolo e condizioni topografiche, Gazzetta Ufficiale n. 42 del 20 febbraio 2018.*