

## Elastic response spectra of near-fault ground motions

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Earthquake ground motions recorded in near-fault zones differ from those observed in the far-fault regions. The impulsive nature of the velocity and displacement ground motions observed can have severe implications for flexible structures. Salient features of the response spectra of near-fault ground motion is studied by using recorded accelerograms.

The dataset used in this work consists of 106 forward directivity affected records from 36 worldwide earthquakes. Mathematical models proposed by [1], describing the earthquake response spectra as a continuous function of moment magnitude, predominant period of ground motion and structural properties, are discussed in details and calibrated using the above mentioned dataset in [2,3].

A thorough investigation of how the parameters of the response spectral shapes scale with moment magnitude and viscous damping ratio of single-degree-of-freedom system is conducted. Following is a comparison between the mean elastic spectral shapes of recorded data, those computed by the model proposed in [1], and the Eurocode 8 recommendations [3].

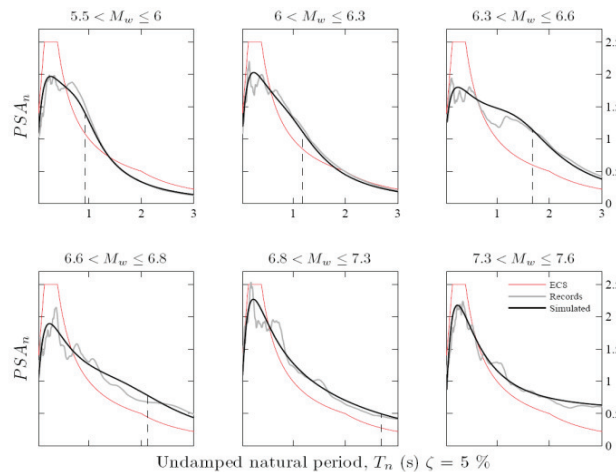


Fig. 1. Comparison of near-fault spectra to Eurocode 8 spectra

## References

- [1] R. Rupakhety, Contemporary issues in earthquake engineering research, PhD-Thesis, School of Engineering and Natural Sciences, University of Iceland, Reykjavík (2010)
- [2] R. Rupakhety, S. U. Sigurðsson, A. S. Papageorgiou and R. Sigbjörnsson, About response of structures to near-fault ground motions, Bulletin of Earthquake Engineering (submitted for publication) (2010)
- [3] S. U. Sigurðsson, Near-fault ground motions and structural design issues, MSc-Thesis, School of Science and Engineering, Reykjavik University (2010)

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