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# Spectral amplification models for response spectrum addressing the directivity effect

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Ground motions with forward directivity effects are known with their significantly large spectral ordinates in medium-to-long periods. The large spectral ordinates stem from the impulsive characteristics of the forward directivity ground motions. The quantification of these spectral amplifications requires the identification of major seismological parameters that play a role in their generation. After running a suite of probabilistic seismic hazard analysis, Moghimi and Akkar (2016) have shown that fault slip rate, fault characteristic magnitude, fault-site geometry as well as mean annual exceedance rate are important parameters that determine the level of spectral amplification due to directivity. These parameters are considered to develop two separate spectral amplification equations in this study. The proposed equations rely on Shahi and Baker (SHB11; 2011) and Chiou and Spudich (CHS13; Spudic et al., 2013) narrow-band forward directivity models. The presented equations only focus on the estimation of maximum spectral amplifications that occur at the ends of the fault segments. This way we eliminate the fault-site parameter in our equations for simplification. The proposed equations show different trends due to differences in the narrow-band directivity models of SHB11 and CHS13. The equations given in this study can form bases for describing forward directivity effects in seismic design codes.

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