ESC2016-673, 2016
35th General Assembly of the European Seismological Commission

35th General Assembly of the European Seismological Commission
4–10 September 2016 Trieste

Site effects and non-linear soil behavior study using data from the IONIANET borehole array

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During its short operation (1996-2000) the IONIANET borehole array in Cephalonia (Greece), recorded more than fifty local earthquakes providing good quality recordings with $0.01g \leq PGA \leq 0.2g$. Analyses of this data set exhibits significant site effects of the topmost soft geologic layer compared to underlain stiff formation as well as different site response in each horizontal component. Azimuthal distribution of the triggering earthquakes with respect to site response is studied and corresponding standard deviation is discussed. Due to very soft soil surface material, non-linear soil behavior is also investigated in terms of PGA and PGV and discussed in the light of similar empirical or/and theoretical studies.