

Estimation of Strong Ground Motion around Golcuk during the Kocaeli, Turkey earthquake of 1999

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We estimated strong ground motions at the near fault-area, Golcuk, during the Kocaeli, Turkey earthquake of 1999, considering non-linearity of surface geology based on 1D propagation theory and applying two steps empirical Green's function method. First, we synthesized the largest aftershock (LA) motion using small events and obtained the mainshock motion at the bedrock using the synthetic LA motion. Finally, we estimated the surface motions during the mainshock considering non-linear behavior of soft sediments. Estimated PGV along the coast to be 1.5 to 3 times larger than those at hillside. Ground motions at the west of Golcuk, GLN, are large compared with those at the east of Golcuk, GLF, due to forward directivity and less non-linearity of the surface ground.