TEMPORAL VARIATION OF S-WAVE VELOCITY AT PORT ISLAND VERTICAL ARRAY SITE DURING AND AFTER THE HYOGOKEN-NANBU EARTHQUAKE BY USING MODIFIED NORMALIZED INPUT-OUTPUT MINIMIZATION (MOD-NIOM) METHOD

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ABSTRACT: New method of wave propagation analysis is introduced and is used to analyze the time histories during and after the Hyogoken-nanbu earthquake at Port Island site in Kobe. The results show large reduction of the S-wave velocity at the surface layer (0-16m) and large reduction of peak amplitude of ground motion at ground surface during the main shock, indicating liquefaction of that layer. The reflected peaks from ground surface could not be seen during main shock but can clearly be seen in the aftershocks at depths. However, the reflected peaks from the boundary of the liquefied and non-liquefied layers can be seen during liquefaction.

Key words: wave propagation, temporal variation of S-wave velocity, liquefaction, vertical array, amplitude, soil stiffness