

COLLABORATIVE RESEARCH CENTER 837

INTERACTION MODELING IN  
MECHANIZED TUNNELING

RUB

# EFFECT OF STRATUM IRREGULARITY ON GROUND SURFACE DAMAGE DURING/AFTER THE OCCURRENCE OF AN EARTHQUAKE

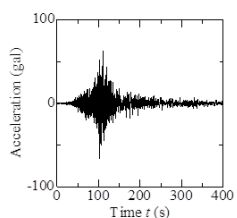
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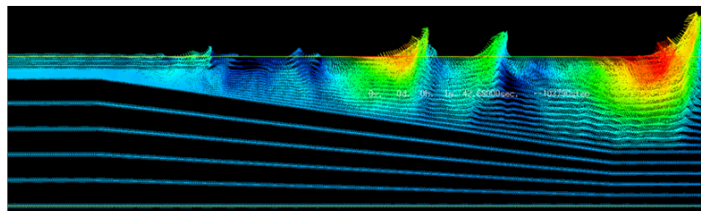
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One of the important characteristic of surface waves is that distance attenuation is small compared with body waves. Therefore, it can propagate to hundreds of kilometers away from epicenter, and leads to a post-motion phenomenon of relatively large continued tremors even after the primary motion. However, the influence of surface waves on liquefaction damage is not fully understood yet. Moreover, most of the existing damage prediction methods not only do not substan-

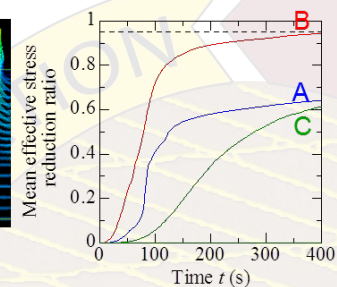
tially take into consideration the nonlinearity of the ground but also are vertical 1-dimensional evaluations, so multidimensional effects due to an irregular stratigraphic and bedrock structure are not taken into consideration. 2D elasto-plastic effective stress analysis in this study indicate that interference between surface waves and body waves generate localized and extensive liquefaction damage, and multidimensional effects should be considered for precise damage predictions.



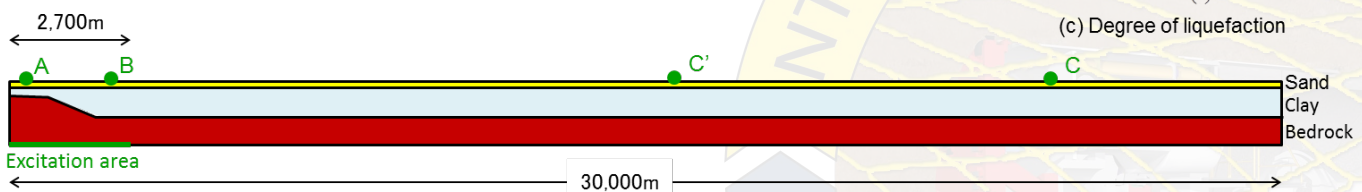
(a) Input seismic wave



(b) Generation and propagation of surface waves from irregularly shaped bedrock (velocity vector)



(c) Degree of liquefaction



Guests are welcome!