Geophysical Research Abstracts
Vol. 19, EGU2017-11868, 2017
EGU General Assembly 2017

SoiLique: A MATLAB® Based Program to analyze soil Liquefaction and some applications/comparisons

Ekrem Bekin and Ferhat Özçep
Istanbul University, Geophysical Engineering, Istanbul, Turkey

Soil liquefaction is one of the ground failures induced by earthquakes. During dynamic loading, i.e. an earthquake, pore water pressure increases in undrained and cohesionless soils. Therefore, soils lose their solid behavior and act as if liquefied materials. In general, the earthquake hazard risk increases because of the liquefied behavior. In order to decrease liquefaction-induced failures and hazards, some empirical formulas have been used over decades. A unitless parameter, the safety factor, can be calculated by the help of these empirical formulas. The safety factor of liquefaction can be calculated from different in-situ tests (i.e. SPT or CPT) and the shear wave velocity of a corresponding research area. In addition to the safety factor, the consolidation depending on soil liquefaction can be calculated. The aim of this study is writing a MATLAB® gui to make soil liquefaction analysis (namely, calculations mentioned above). In other words, SoiLique calculates Cyclic Stress Ratio, Cyclic Resistance Ratio (from SPT, CPT, and shear wave velocity), the safety factor of liquefaction and consolidation depending on liquefaction. Some applications from liquefied sites in Turkey and some comparisons with other liquefaction software will be carried out.