

## Full-Field Estimation of Cyclic Threshold Shear Strain

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**Abstract :** Cyclic threshold shear strain is the cyclic shear strain amplitude that serves as the indicator of the development of pore water pressure. The parameter can be obtained by performing either cyclic triaxial test, shaking table test, cyclic simple shear or resonant column. In a cyclic triaxial test, other researchers install measuring devices in close proximity of the soil to measure the parameter. This method can cause sample disturbance which can affect the result of the experiment. Although there are already existing methods in determining the parameter, the movement and behavior of the soil before and after reaching this parameter needs to be understood. A method that can be used is by applying full-field measurement technique. The technique uses a camera to monitor and measure the movement of the soil. This study is an attempt to estimate the cyclic threshold shear strain parameter. The applied technique has the capacity to monitor the behavior of the particles at cyclic loading. For this study, the technique was incorporated in a strain controlled consolidated undrained cyclic triaxial test. Two-dimensional image processing was implemented. Lucas and Kanade optical flow algorithm were applied to track the movement of the soil particles. Results from the full-field measurement technique were compared with the results from the linear variable displacement transducer.

**Keywords :** cyclic loading, cyclic threshold shear strain, full-field measurement, optical flow

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