

## Numerical Investigation of Static and Dynamic Responses of Fiber Reinforced Sand

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**Abstract :** Soil reinforced with randomly distributed fibers is an attractive means to improve the performance of soil in a cost effective manner. Static and dynamic characterization of fiber reinforced soil have become important to evaluate adequate performance for all classes of geotechnical engineering problems. Present study investigates the behaviour of fiber reinforced cohesionless soil through numerical simulation of triaxial specimen. The numerical model has been validated with the existing literature of laboratory triaxial compression testing. A parametric study has been done to find out optimum fiber content for shear resistance. Cyclic triaxial testing has been simulated and the stress-strain response of fiber-reinforced sand has been examined considering different combination of fiber contents. Shear modulus values and damping values of fiber-reinforced sand are evaluated. It has been observed from results that for 1.0 percent fiber content shear modulus increased 2.28 times and damping ratio decreased 4.6 times. The influence of amplitude of cyclic strain, confining pressure and frequency of loading on the dynamic properties of fiber reinforced sand has been investigated and presented.

**Keywords :** damping, fiber reinforced soil, numerical modelling, shear modulus

**Conference Title :** ICGGE 2018 : International Conference on Geogrids and Geotechnical Engineering

**Conference Location :** Mumbai, India

**Conference Dates :** February 22-23, 2018