Proposing a Failure Criterion for Cohesionless Media Considering Cyclic Fabric Anisotropy

Authors : Ali Noorzad, Ehsan Badakhshan, Shima Zameni

Abstract : The present paper is focused on a generalized failure criterion for geomaterials with cross-anisotropy. The cyclic behavior of granular material primarily depends on the nature and arrangement of constituent particles, particle size, and shape that affect fabric anisotropy. To account for the influence of loading directions on strength variations, an anisotropic variable in terms of the invariants of the stress tensor and fabric into the failure criterion is proposed. In an extension to original CANAsand constitutive model two concepts namely critical state and compact state play paramount roles as all of the moduli and coefficients are related to these states. The applicability of the present model is evaluated through comparisons between the predicted and the measured results. All simulations have demonstrated that the proposed constitutive model is capable of modeling the cyclic behavior of sand with inherent anisotropy.