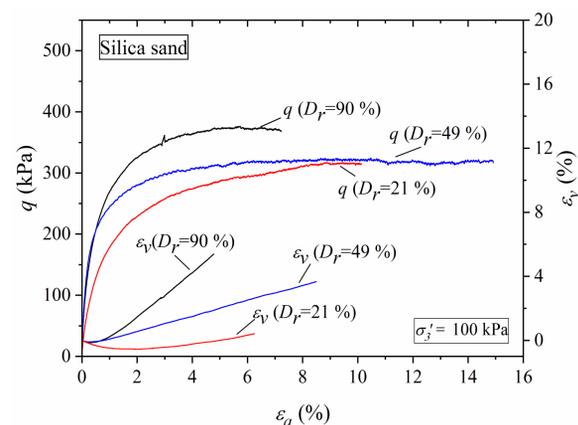


The precise assessment of stress wave velocities and stiffness is indispensable for the accurate design of structures as well as authentic geotechnical characterization of sediments. The development of the geophysical testing method is important to estimate the mechanical properties of in-situ soils. In the present study, planar piezoelectric transducers have been employed to measure the shear wave ( $V_s$ ) and compression wave velocities ( $V_p$ ) of silica sand in both isotropic and anisotropic stress states. Wave velocities of loose and dense specimens at large axial strain tend to converge similar to the stress-strain relationship. The increment of normal stress component ( $\sigma_1$ ) has a significant influence on compression wave velocity as compared to shear wave velocity. This axial strain at which peak shear wave velocity is observed is comparable to the axial strain at which fabric of the specimen takes place.

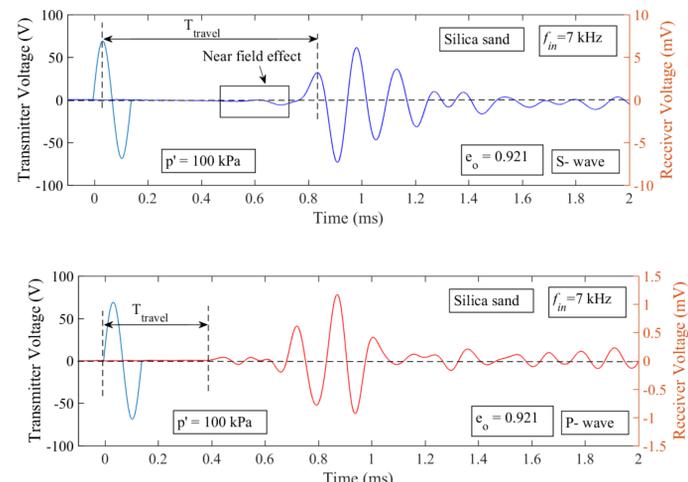
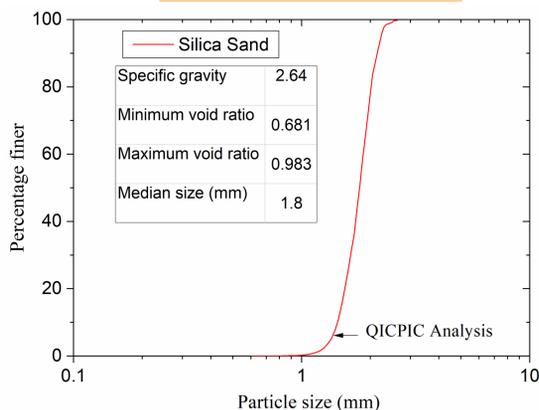
### Development of Disk Transducers for Standard Triaxial Apparatus



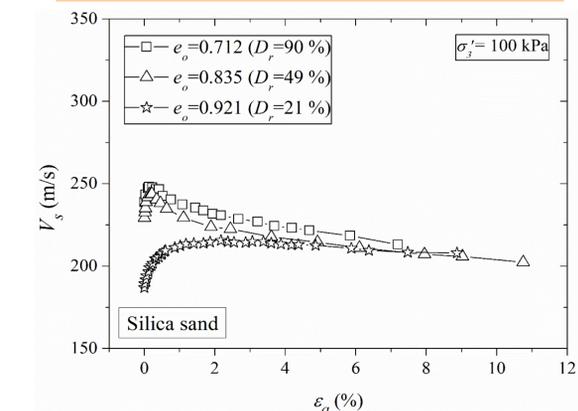
### Deviator stress vs. axial strain



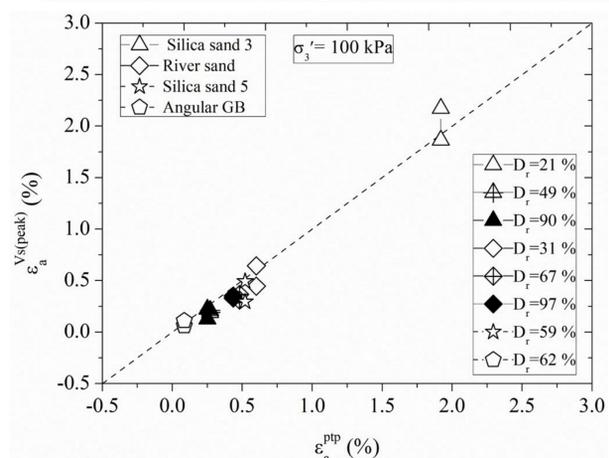
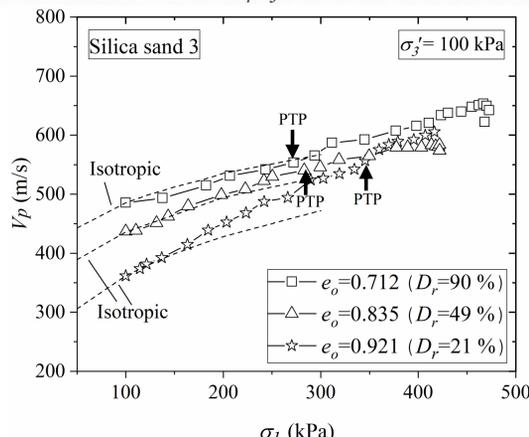
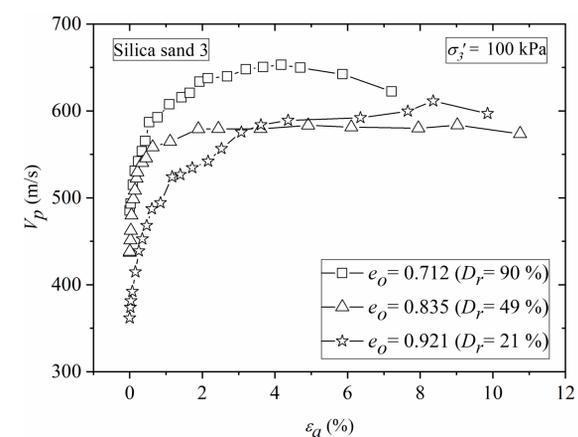
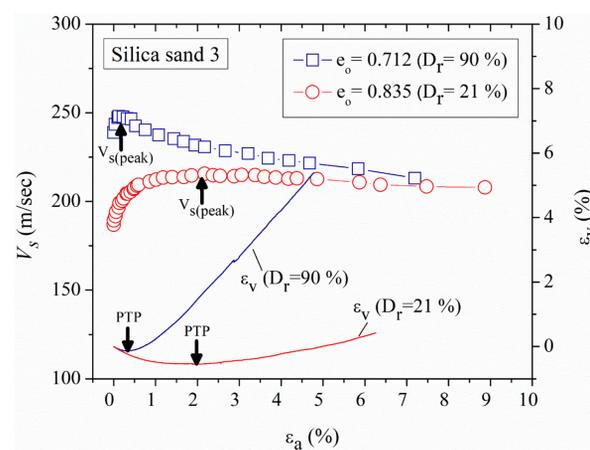
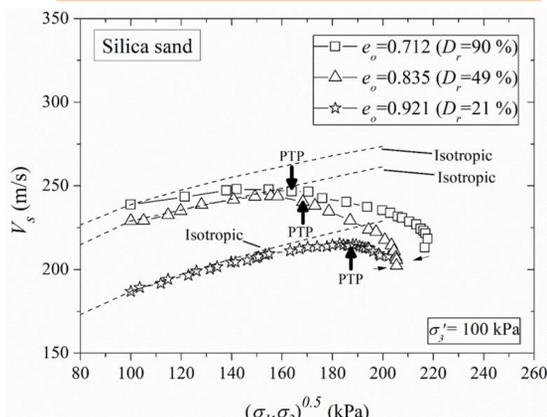
### Tested Material



### Wave velocities vs. axial strain



### Wave velocities vs. stress state



★  $V_s$  &  $V_p$  of loose and dense specimens converge at large axial strain

★ Increment of normal stress has substantial effect on  $V_p$  as compared to  $V_s$

★  $\epsilon_a$  at peak  $V_s \approx \epsilon_a$  at which fabric of specimen changes