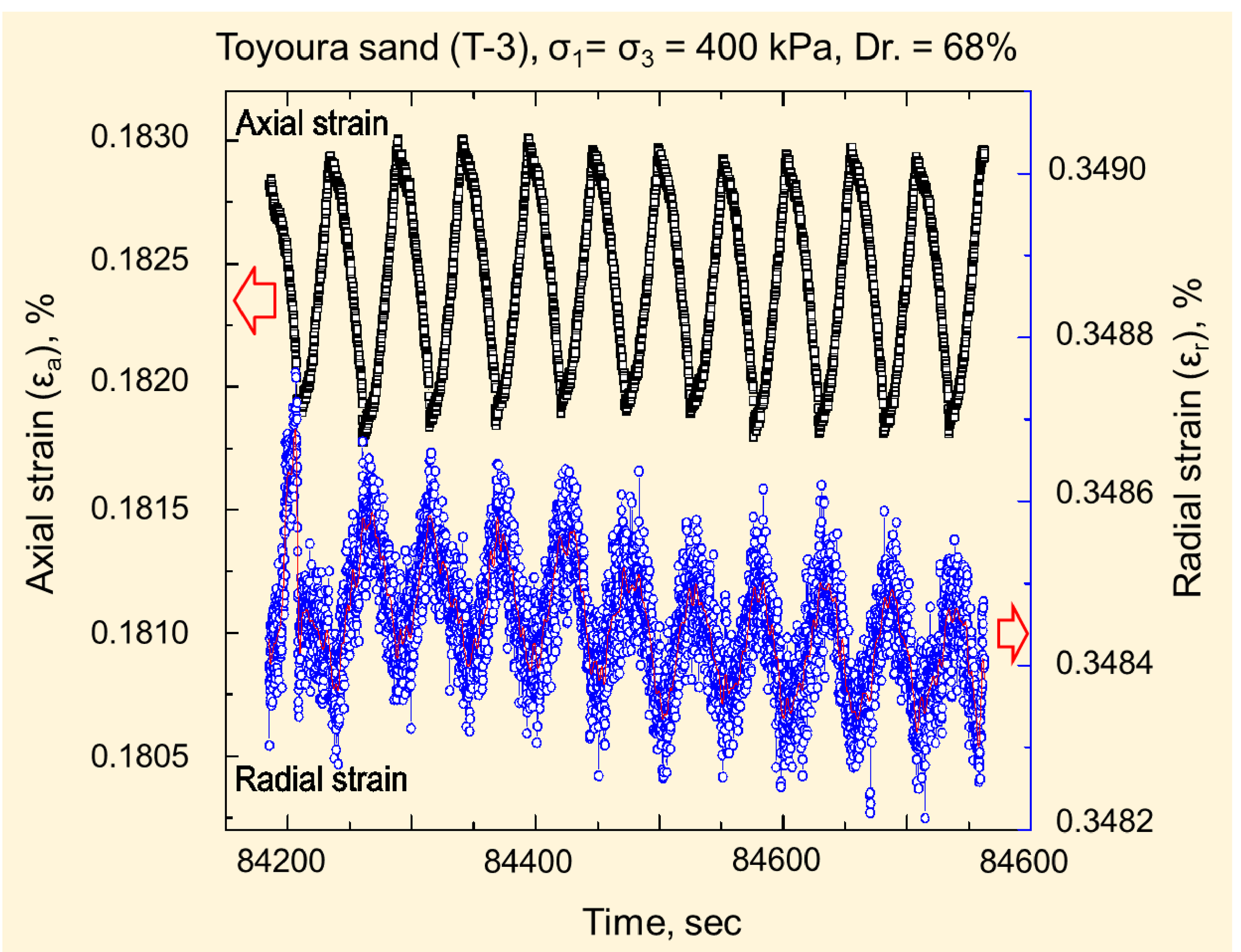
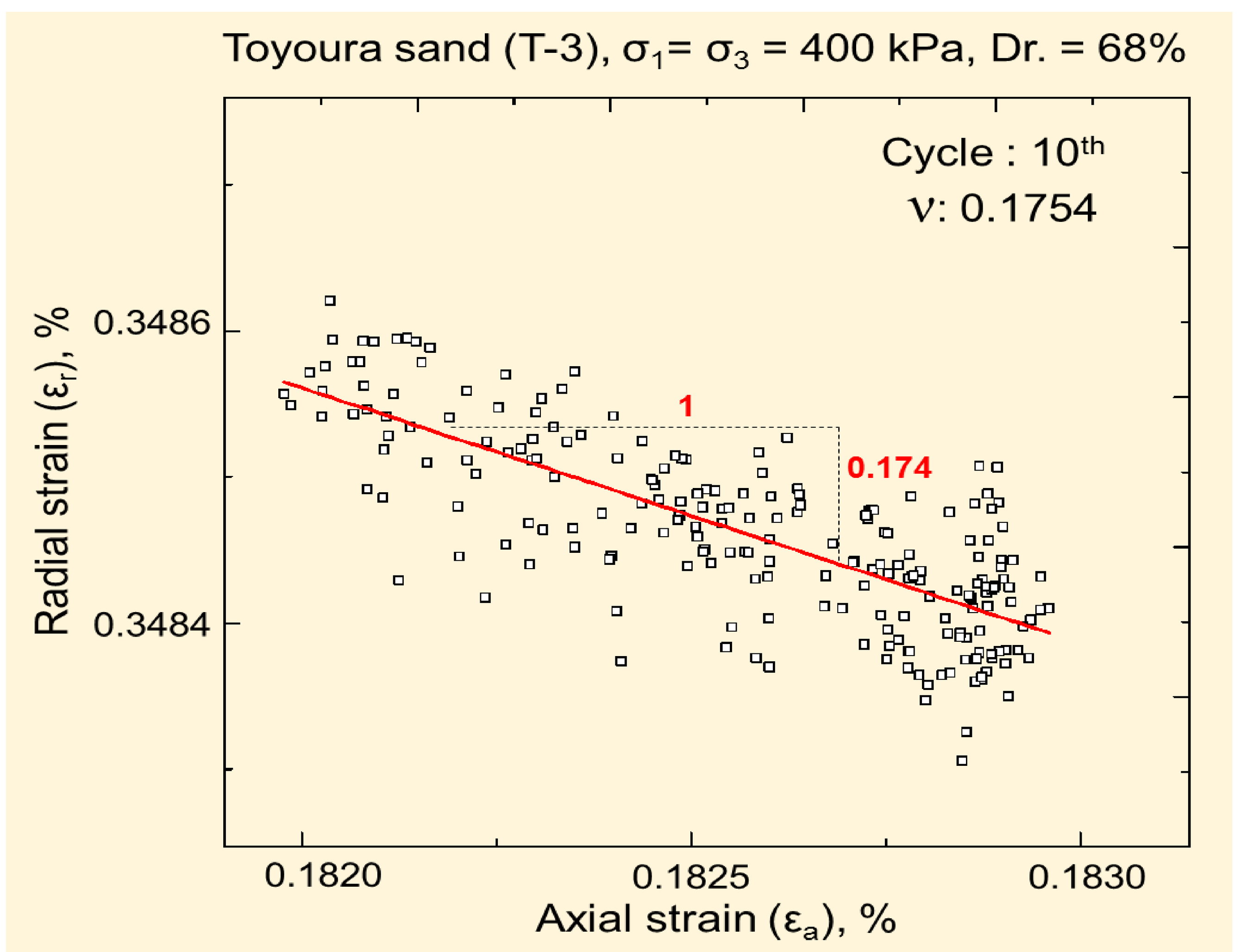
POISSON'S RATIOS EVALUATED BY STATIC AND DYNAMIC METHODS

静的および動的手法によって測定した砂供試体のポアソン比

Poisson's ratio is defined as the ratio of radial strain to axial strain. Axial and radial strains were precisely monitored using LDTs and clip gauges during small cyclic loadings and the strain increments in each cycle were evaluated statically. Disk Transducer method is able to evaluate both compressional and shear wave velocities in an identical specimen. With the obtained wave velocities, the Poisson's ratios were computed dynamically. This study is intended to evaluate the Poisson's ratios of the fine granular materials, Toyoura sand and Silica sand.

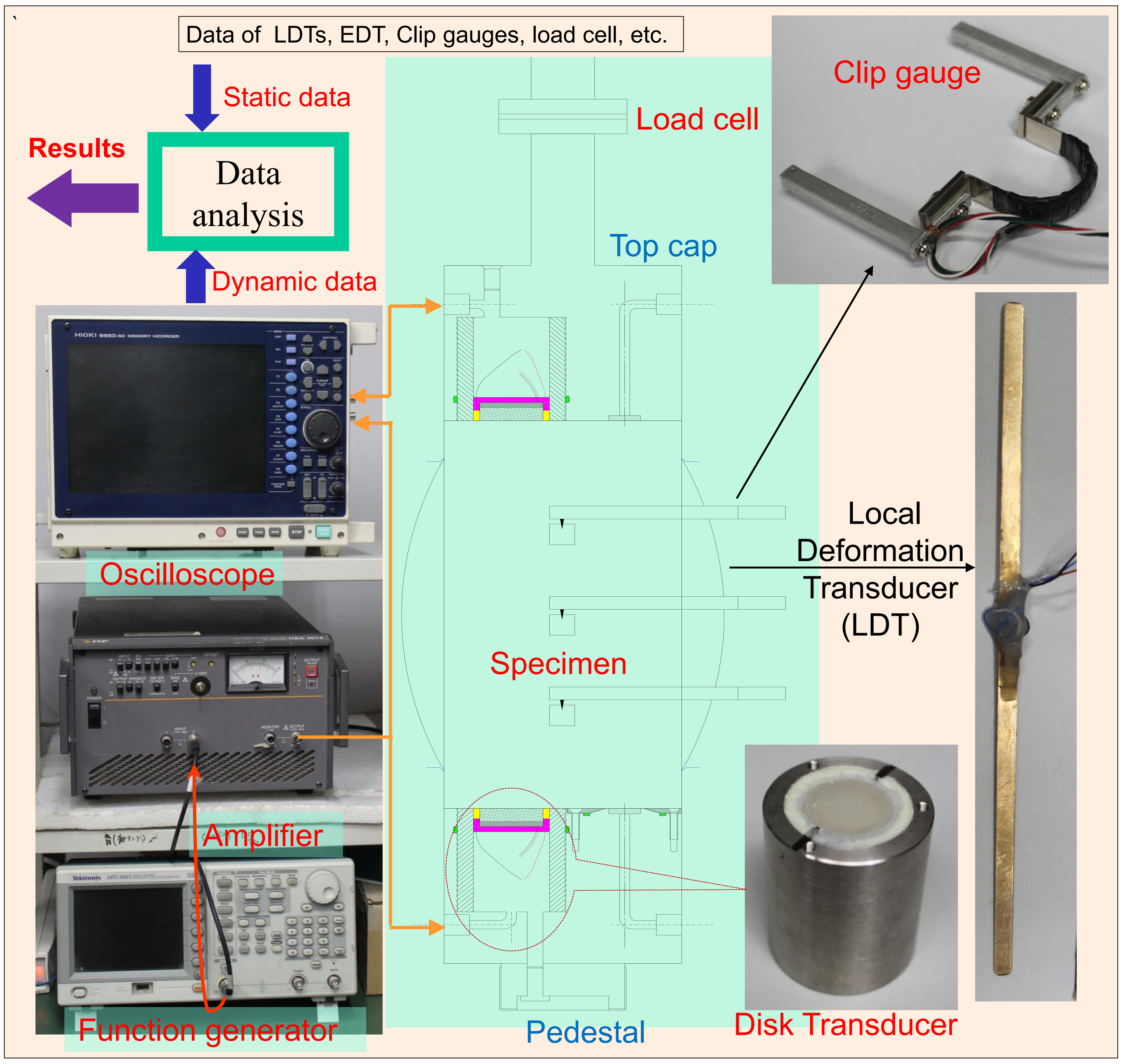
Static method





Poisson's ratio evaluation in each cycle

Experimental set up



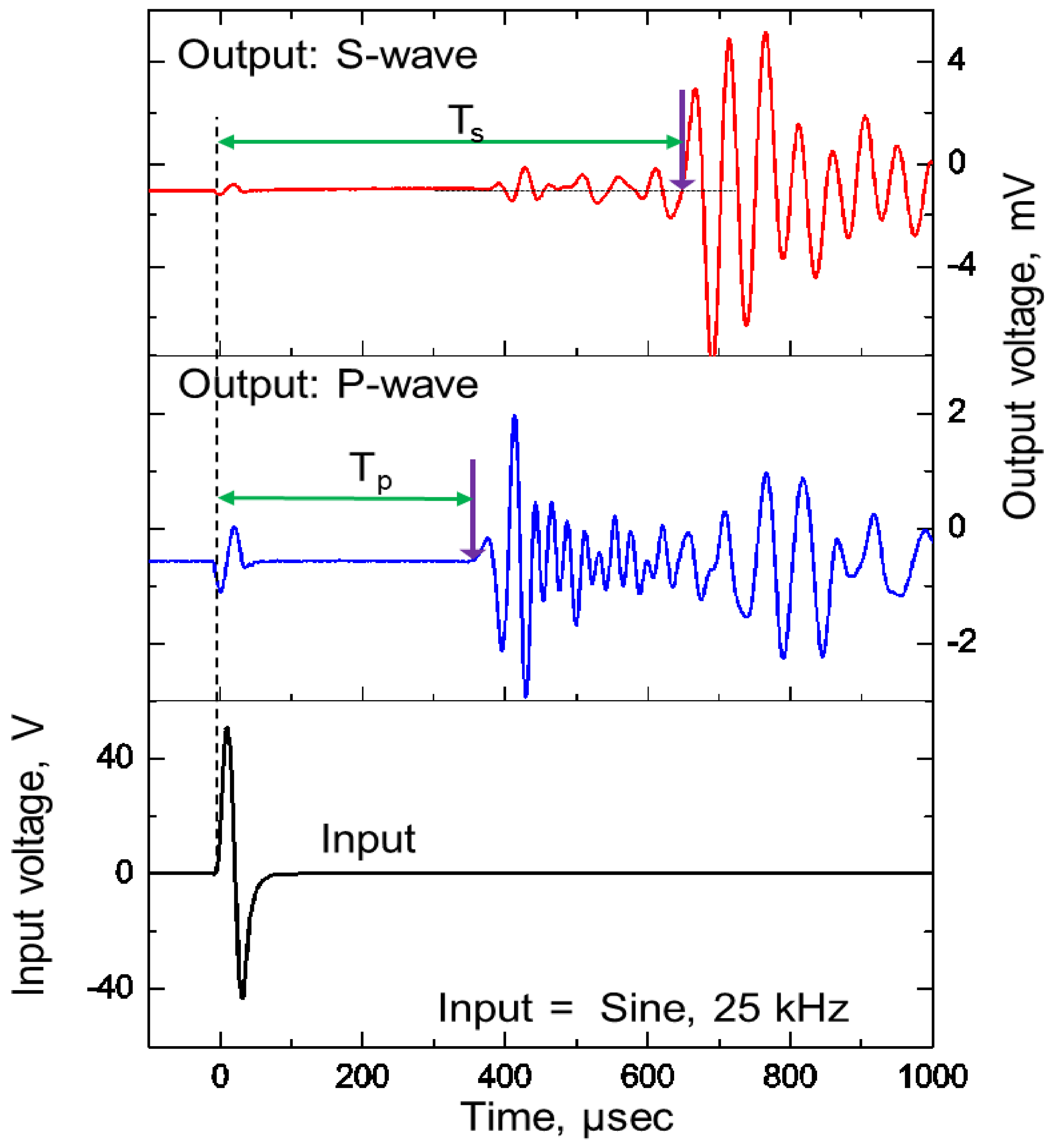
Poisson's ratio

Statically, $\nu = -\dfrac{\delta\varepsilon_r}{\delta\varepsilon_a}$ where, $\varepsilon_a = -\int_{H_0}^{H}\dfrac{dH}{H} = -\ln(\dfrac{H}{H_0})$ & $\varepsilon_r = -\int_{R_0}^{R}\dfrac{dR}{R} = -\ln(\dfrac{R}{R_0})$

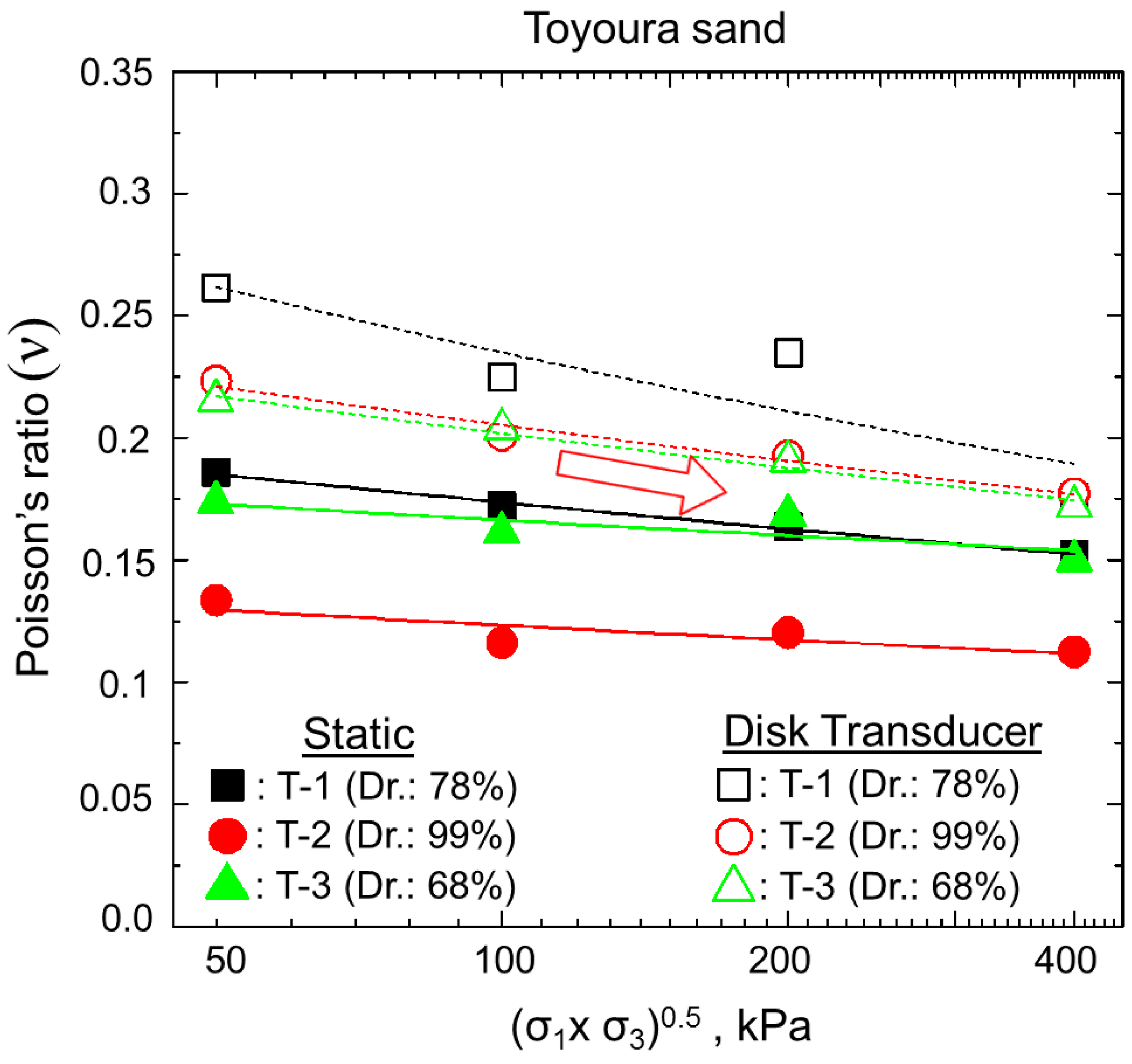
Dynamically, $\nu = \dfrac{(0.5V_p^2 - V_s^2)}{V_p^2 - V_s^2}$ where, $V_P = \dfrac{h}{T_P}$ & $V_S = \dfrac{h}{T_s}$

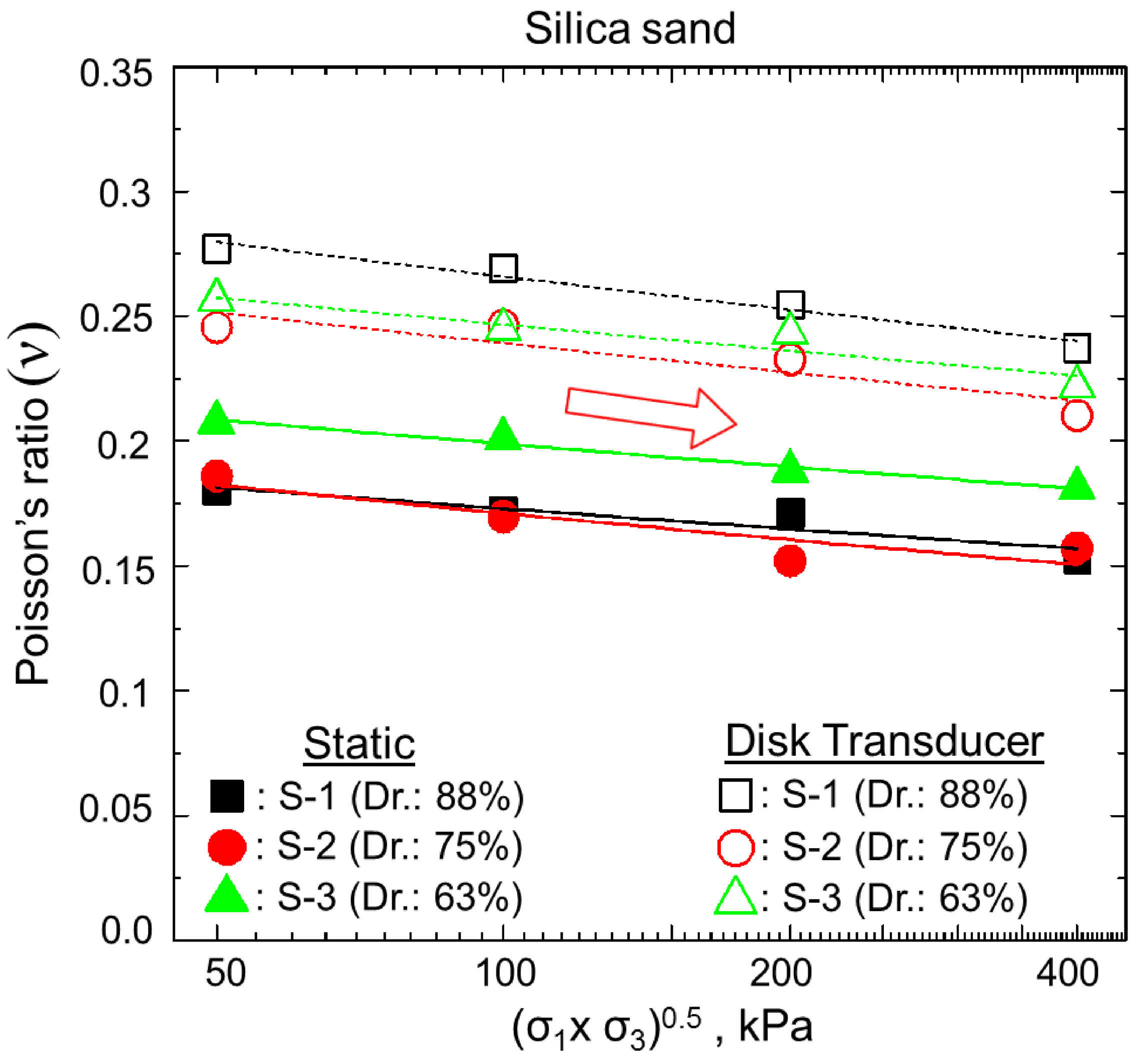
Dynamic method

Silica sand(S-1), Dry, Dr. = 88%, σ1=σ3= 50 kPa



Statically and dynamically evaluated Poisson's ratios





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