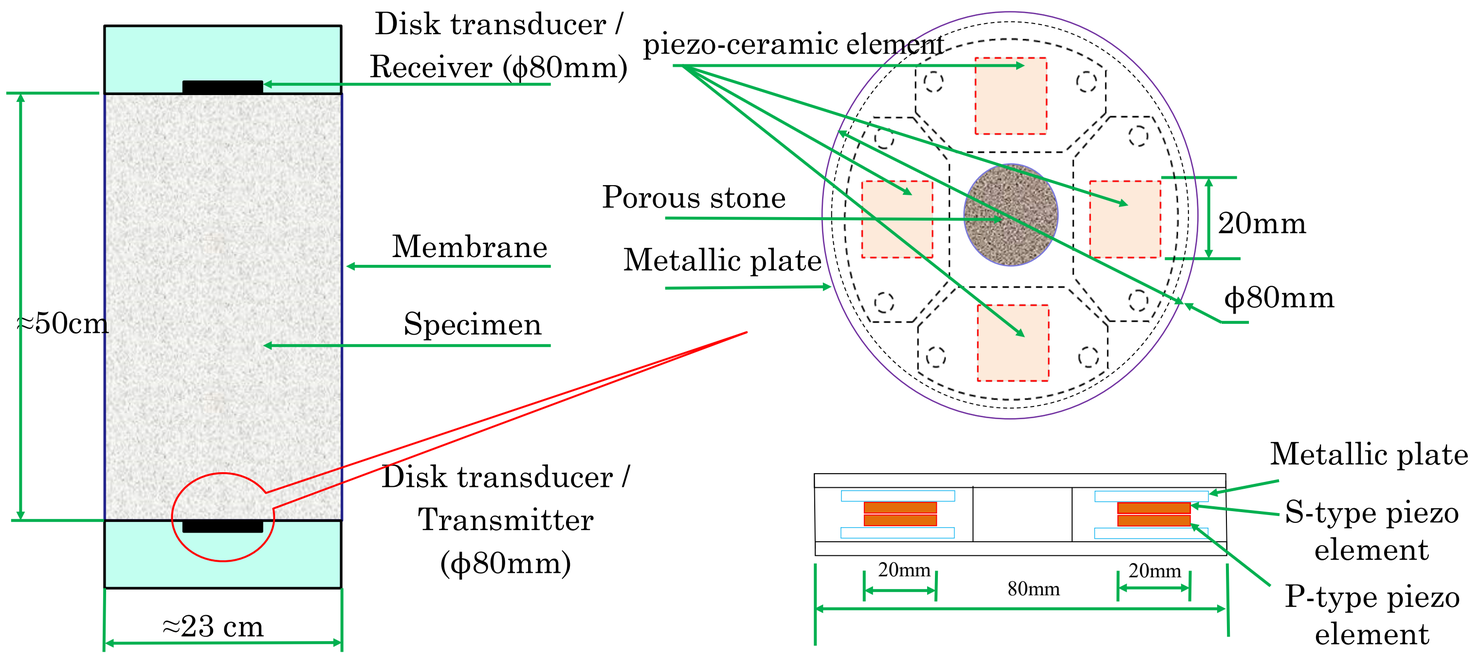
# ELASTIC WAVE MEASUREMENT
# Development of Large Size Disk Transducer

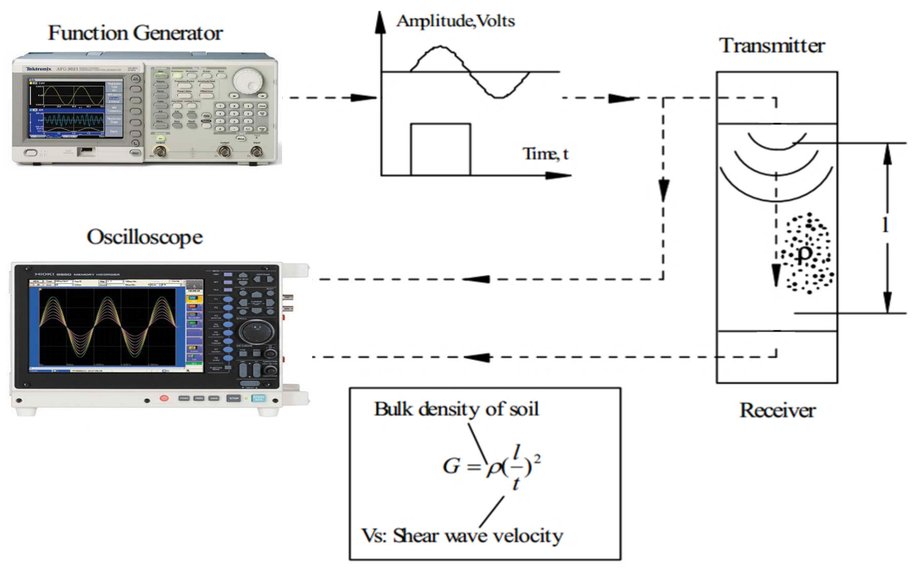
## 大型ディスクトランスデューサーの開発

The elastic wave measurement is becoming popular to obtain small strain stiffness of coarse granular materials. In IIS, various type of transducers are currently used, including bender element (BE), Trigger-Accelerometer (TA), Trigger-Bimorph element (TB) and disk transducer (DT). Recently, disk transducer method has been introduced to overcome the disadvantages of bender element method. The newly developed transducer is applicable to undisturbed sample, cemented specimen and stiff material, as it is not necessary to insert it into the specimen. But, to study the elastic wave of small to large grain size geomaterials on single apparatus is difficult, because of the limitation of size of piezo ceramic element available in market. So, large size disk transducer has been developed and employed on large triaxial apparatus. The development of disk transducer, waveform and elastic properties of Toyoura sand specimen is presented.

## Large Size Disk Transducer

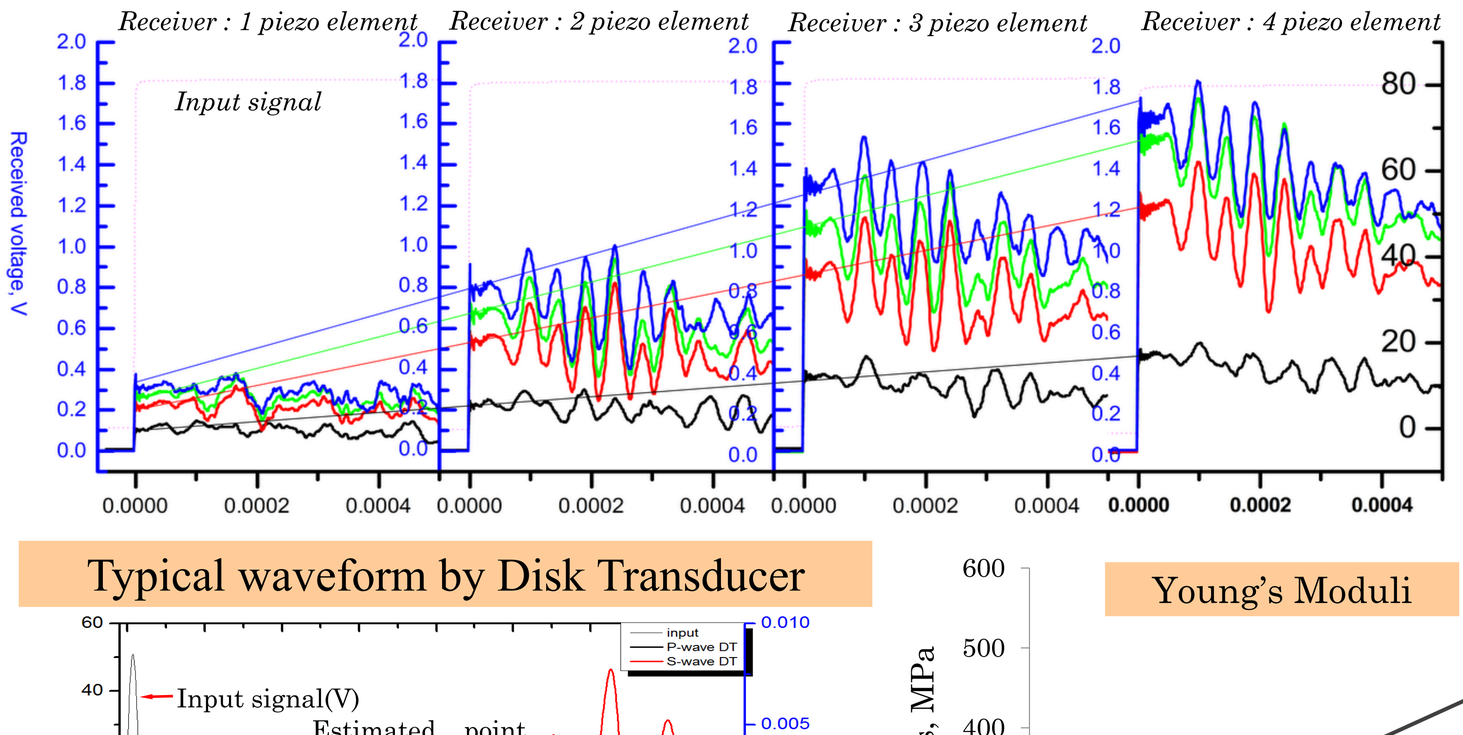



## Shear wave measurement by Disk Transducer

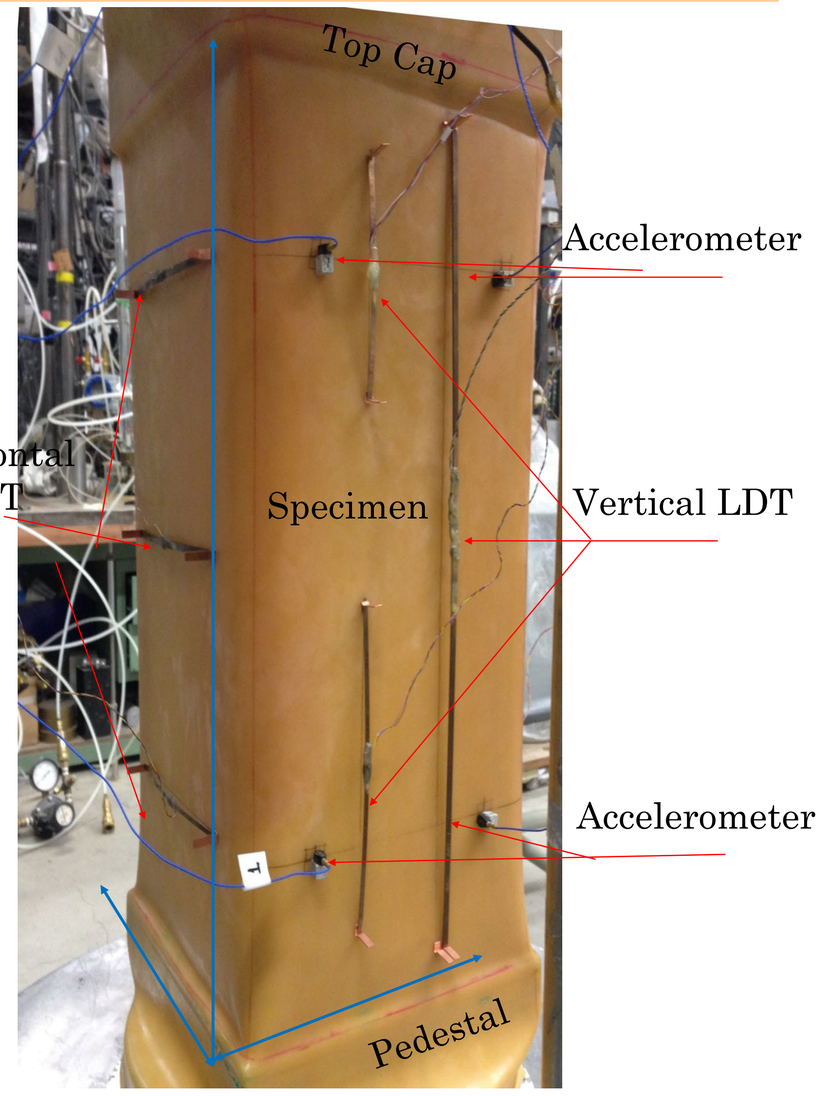



Shear moduli at small strains can be obtained

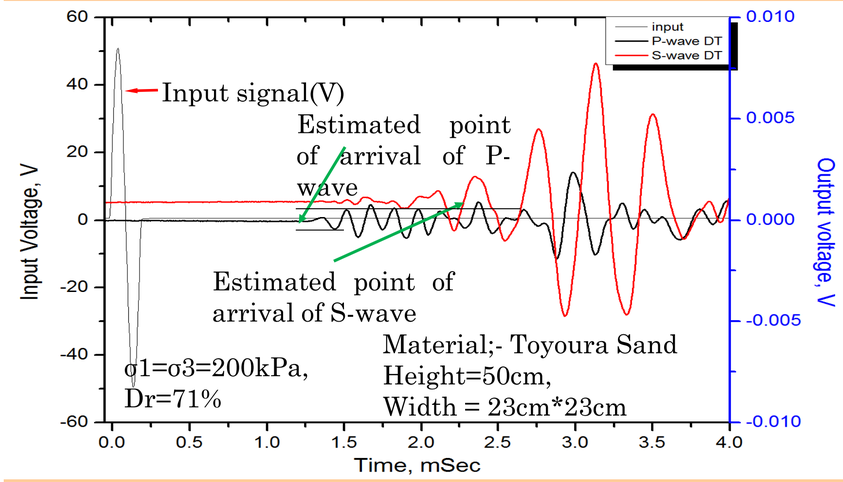
## Received S-wave signal, receiver and transmitter disk are facing each other



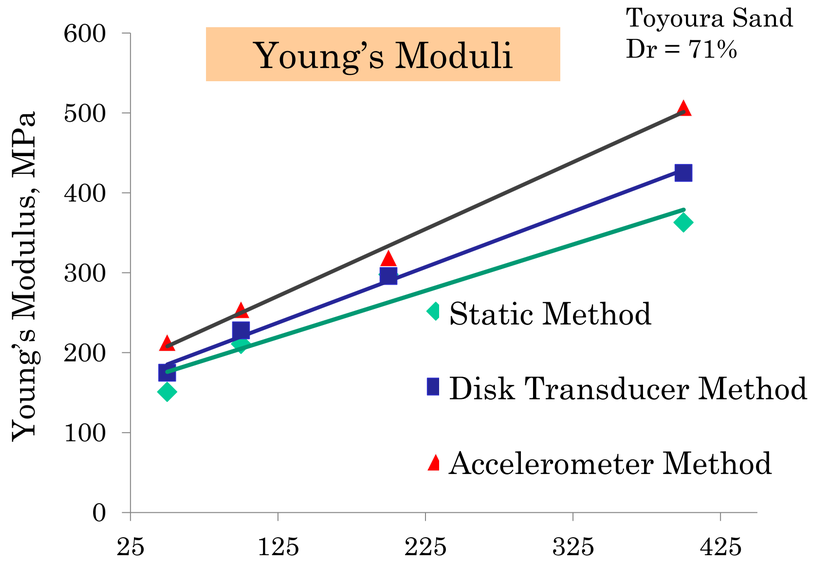

## Specimen and attachment of LDT



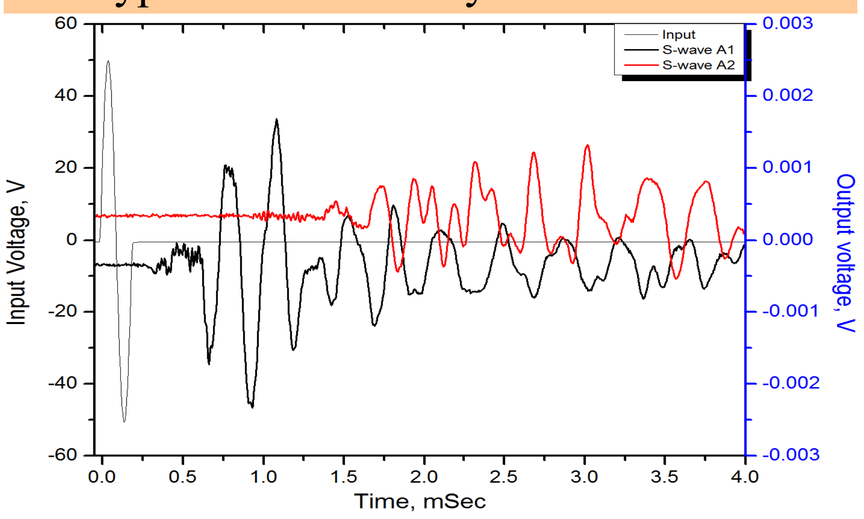

## Typical waveform by Disk Transducer



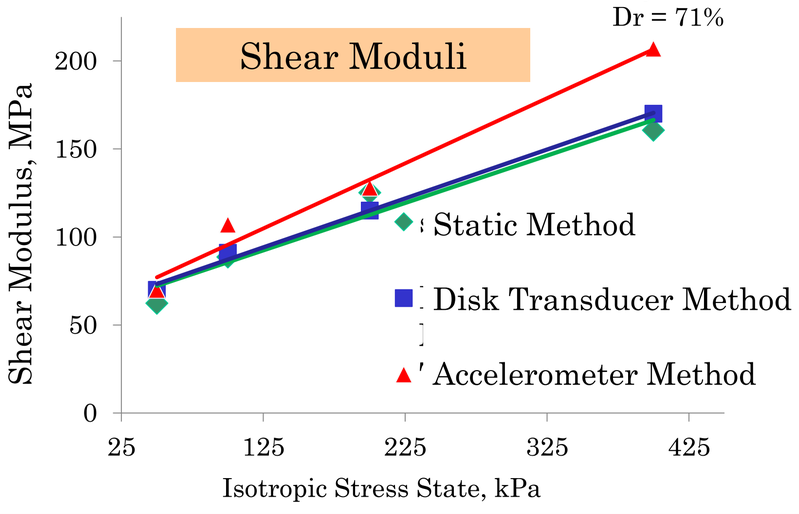

## Young's Moduli



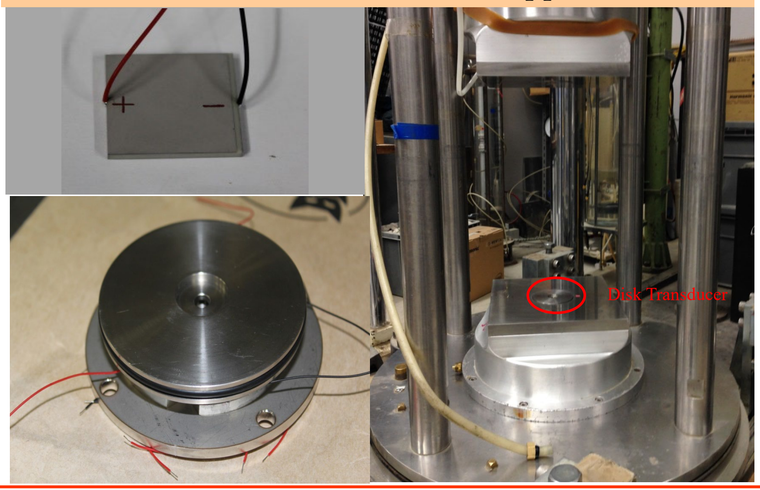

## Typical waveform by Accelerometer




## Shear Moduli




## Used piezo-ceramic element and attachment of Disk Transducer in Triaxial apparatus

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