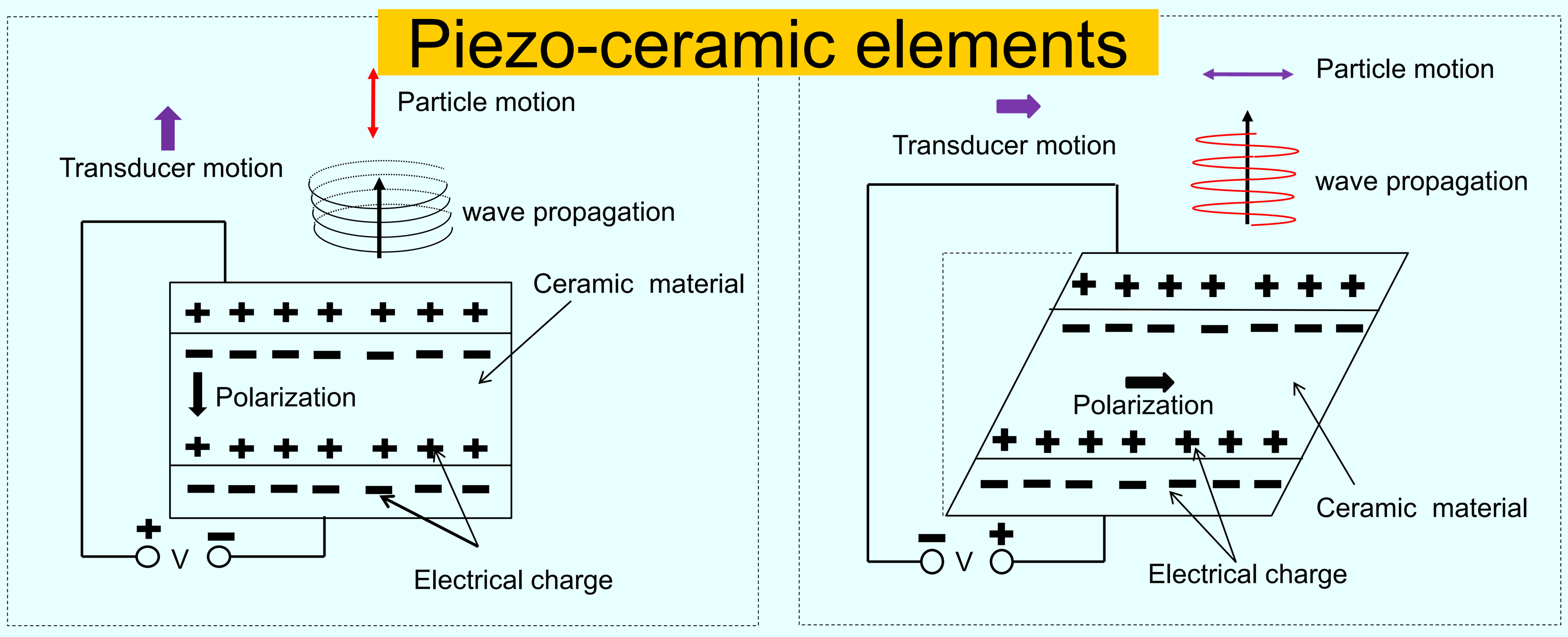
DISK TRANSDUCER

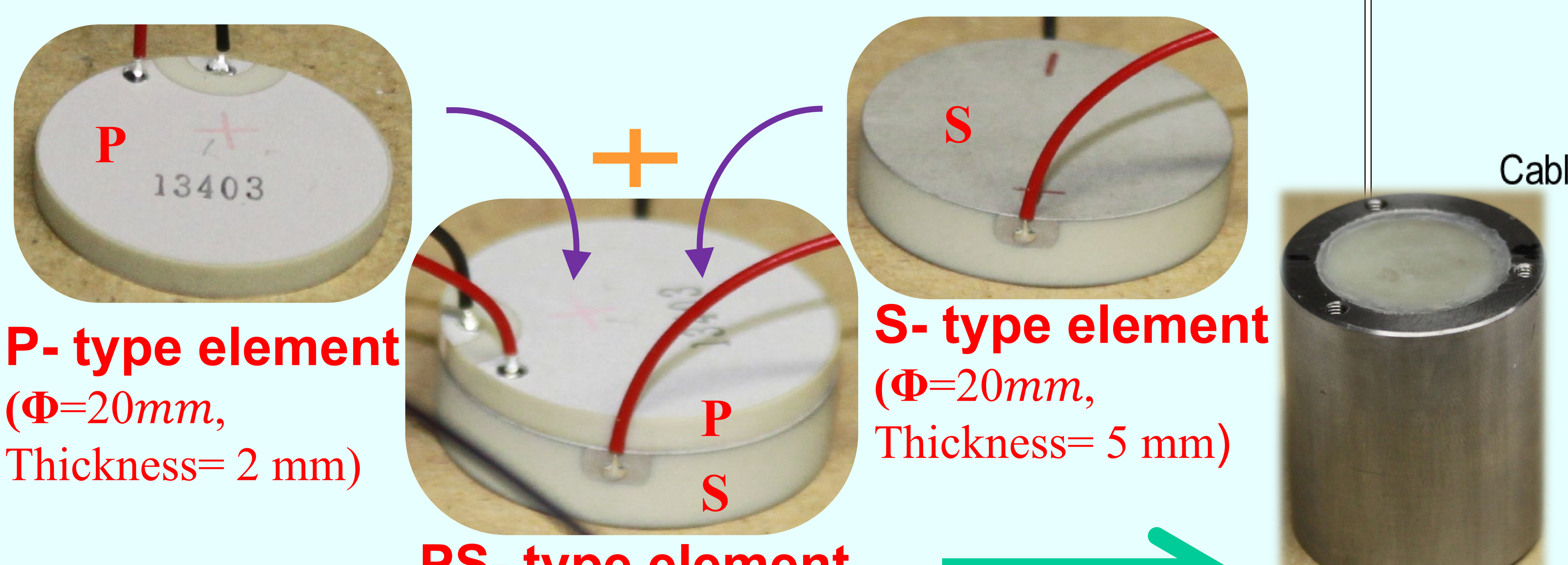
SENSORS FOR P & S WAVE MEASUREMENT

室内土供試体のP波・S波測定用センサの開発

A flat disk shaped transducer was developed to measure elastic waves propagating in a laboratory soil specimen. It is capable of measuring both compressional and shear (P and S) waves in an identical specimen. The typical wave forms obtained on granular materials by this method are presented.

Piezo-ceramic elements



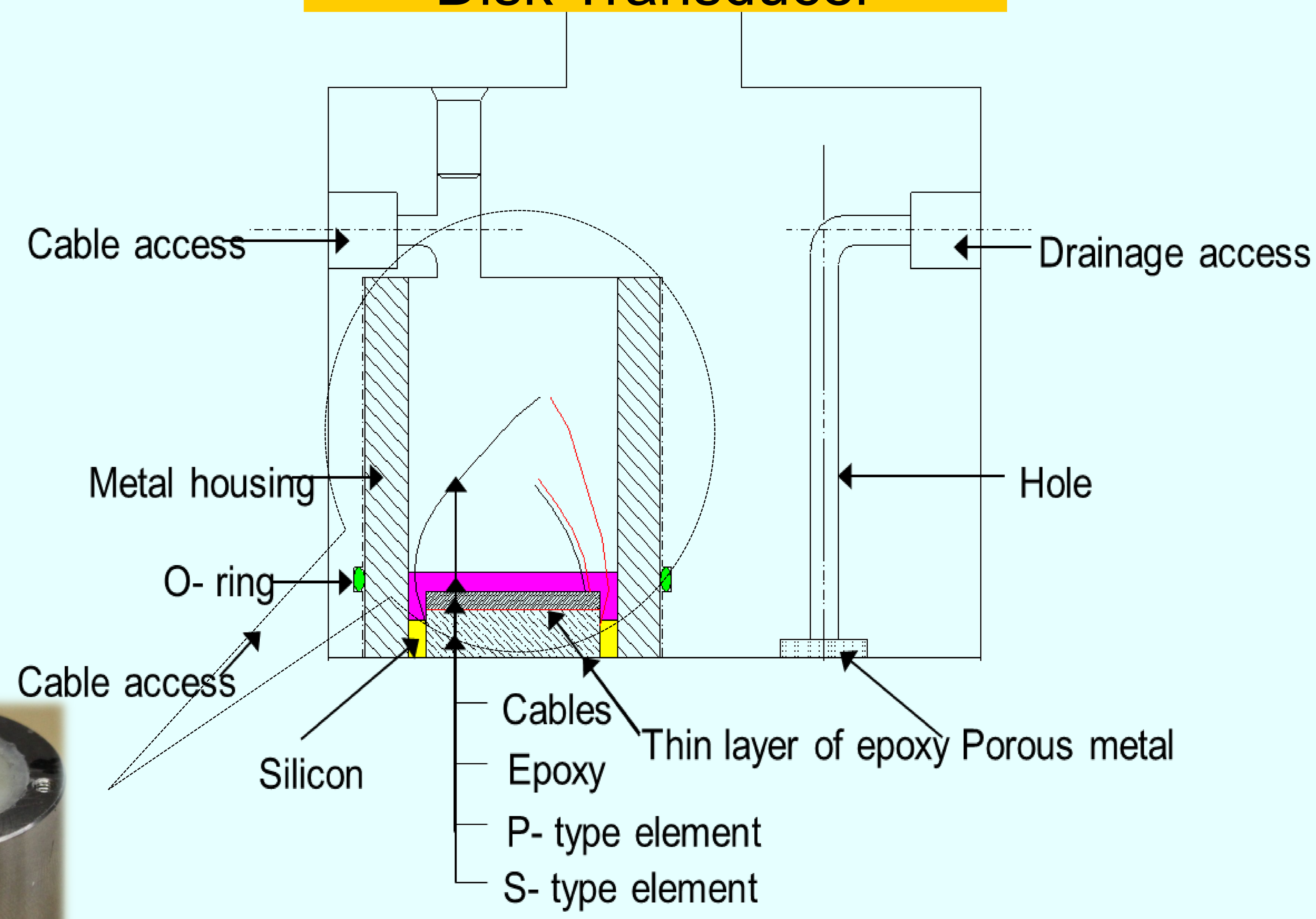


P- type element
(Φ=20*mm*, Thickness= 2 mm)

S- type element
(Φ=20*mm*, Thickness= 5 mm)

PS- type element

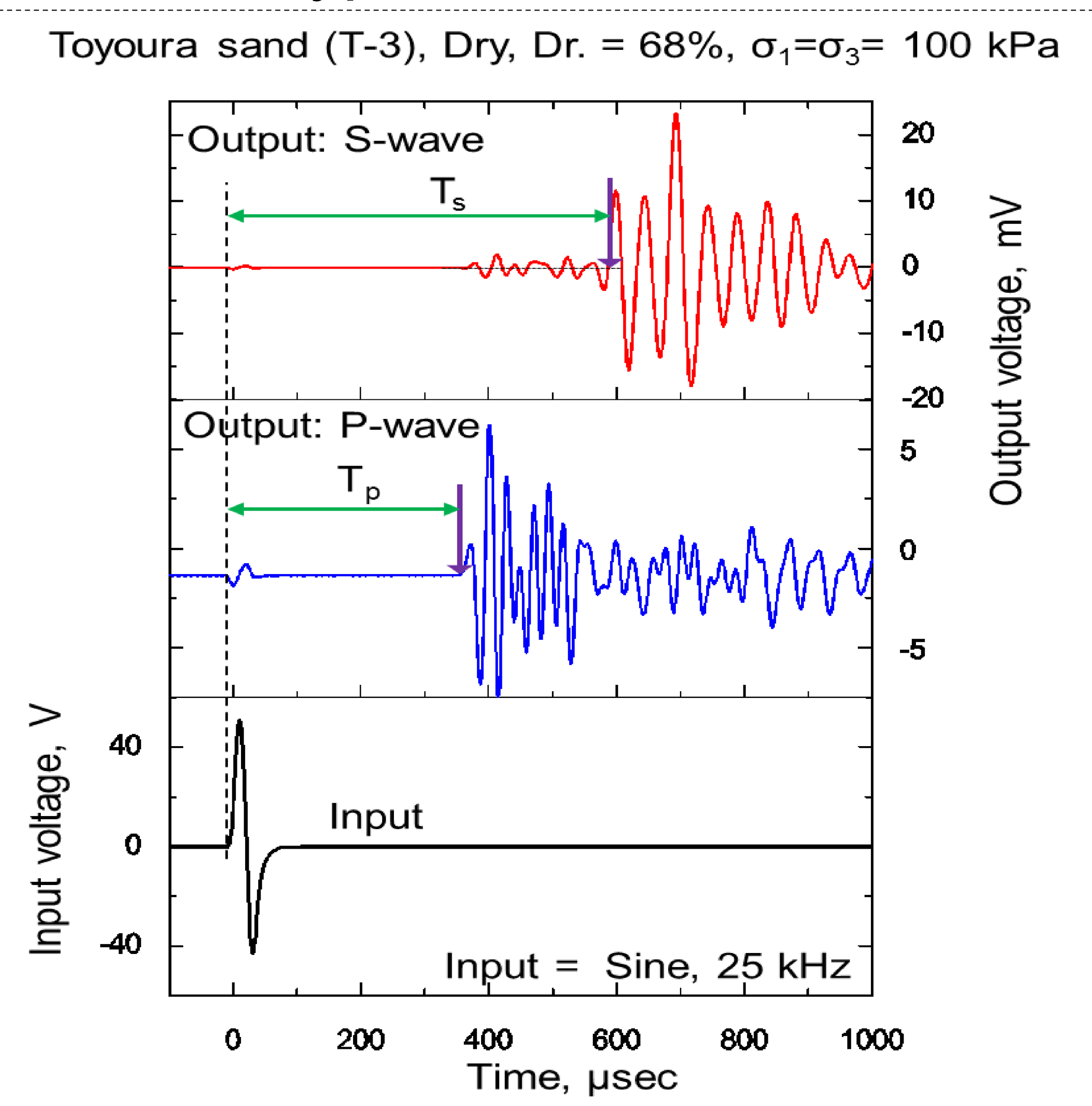
Disk Transducer

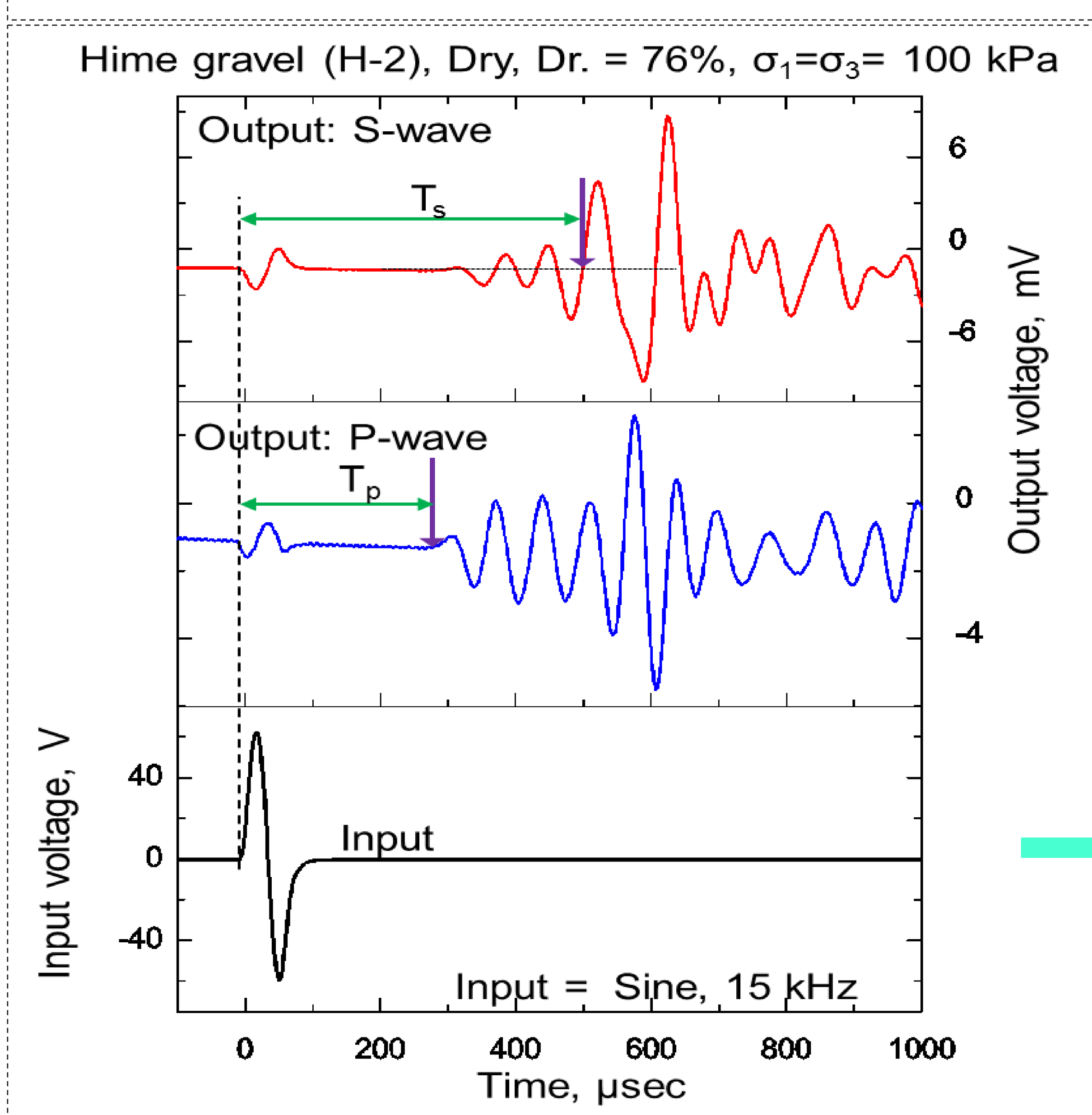


Details of top cap including disk transducer

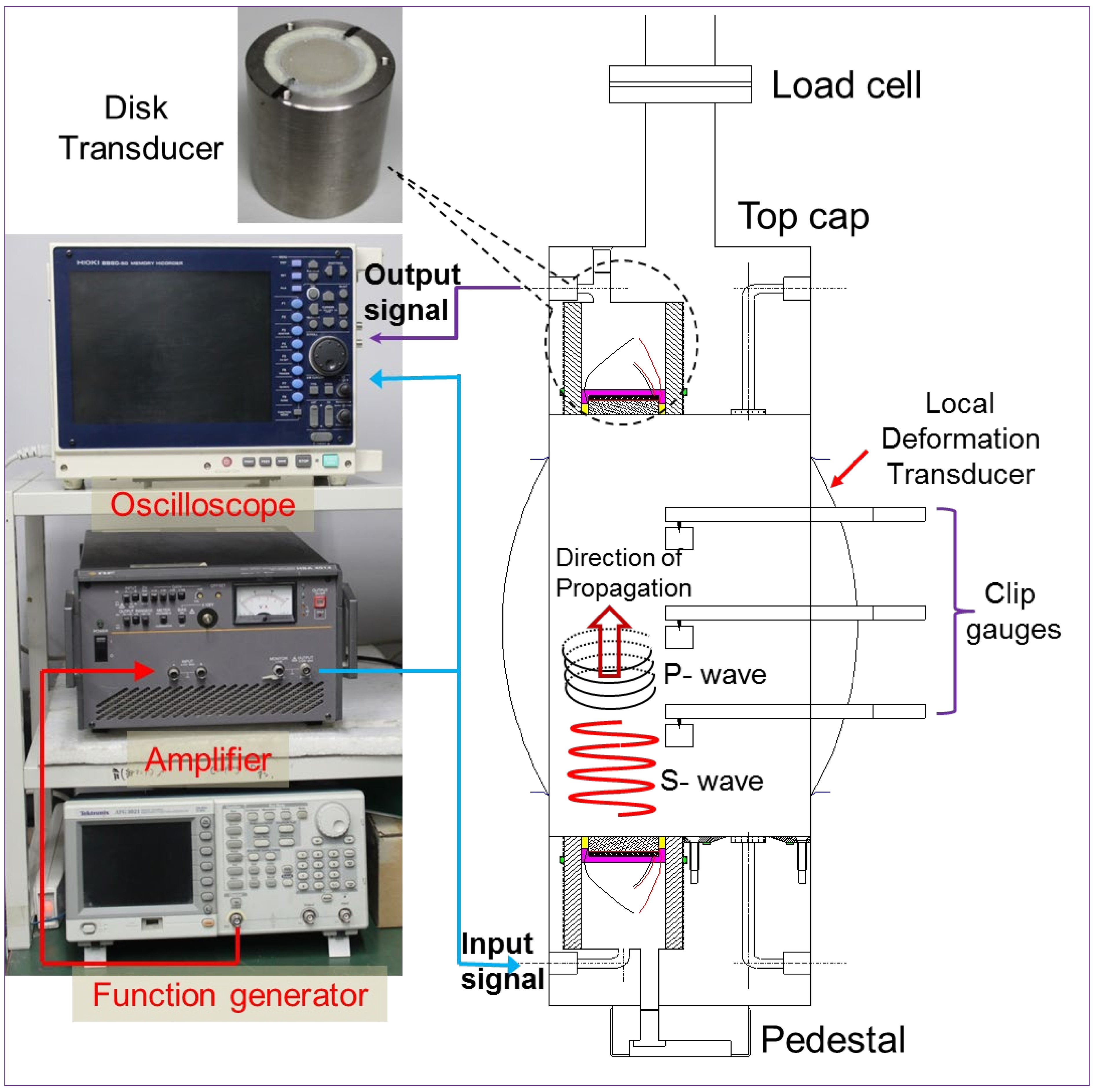
Disk Transducer

Typical waveforms





Experimental set up and data acquisition process



Velocity of signals

$$V_P = \frac{h}{T_P}$$

$$Vs = \frac{h}{T_s}$$

h is height of specimen

Material's properties

$$M = \rho * V_p^2 \qquad G = \rho * V_s^2 \qquad E = \frac{M(1-2\nu)(1+\nu)}{(1-\nu)}$$

Material's properties are evaluated in terms of wave velocity.

$$\nu = \frac{\left(0.5V_p^2 - V_s^2\right)}{V_p^2 - V_s^2} \qquad G = \frac{E}{2(1+\nu)}$$

本研究に関する担当研究室は桑野研究室です.
部屋は東京大学生産技術研究所B棟3階のBw-304

電話：03-5452-6843，FAX：03-5452-6844
E-mail: kuwano@iis.u-tokyo.ac.jp

For further information, contact below.
Prof. Reiko Kuwano,
#Bw-304, Institute of Industrial Science

TEL：+81-3-5452-6843，FAX：+81-3-5452-6844
E-mail: kuwano@iis.u-tokyo.ac.jp

Laxmi Prasad Suwal (2010)