ELASTIC WAVE MEASUREMENT
VARIOUS TYPES OF TRANSDUCERS IN IIS

室内土供試体の弾性波速度測定

The elastic wave measurement is becoming popular to obtain small strain stiffness of soil. In IIS, various types of transducers are currently used, including bender element (BE), trigger-accelerometer (TA), trigger-bimorph element (TB) and disk transducer (DT). The waveform of each transducer on Toyoura sand specimen is presented.

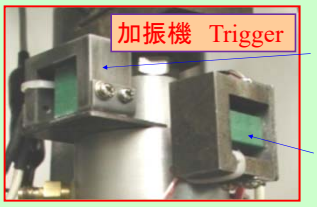
地盤材料の微小ひずみ剛性は、供試体内の弾性波の伝播速度を測定することにより求めることができます。様々なセンサーを用いて砂供試体内のP波およびS波の伝播速度を測定して比較しています。

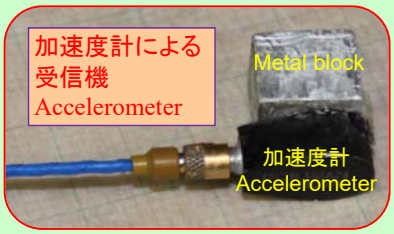
Various types of Transducers

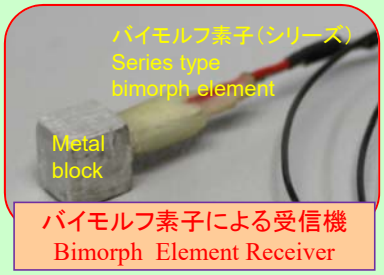
波の送受信に使われる圧電素子はメタルケースの中に収められ、さらに三軸試験装置のトップとペデスタル内に装着する。
Piezo-ceramic elements are used for both transmitter and receiver. Coated elements are encapsulated into metal housing and then installed into top cap and pedestal.

Trigger Accelerometer method
Trigger Bimorph element method

トップに装着した加振機によって送信し、供試体側面2箇所につけた受信機で波を捉える。
The signal is actuated by triggers attached to the top. A pair of sensors put on lateral surface of the specimen receive the signal.





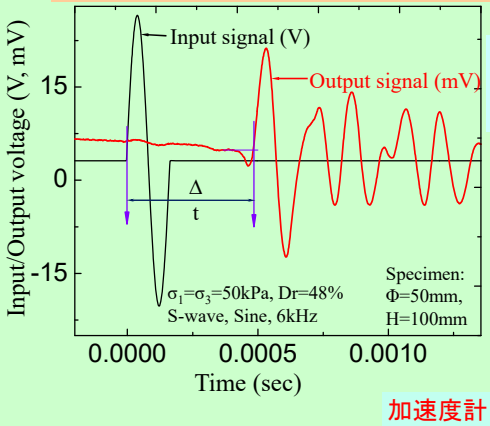


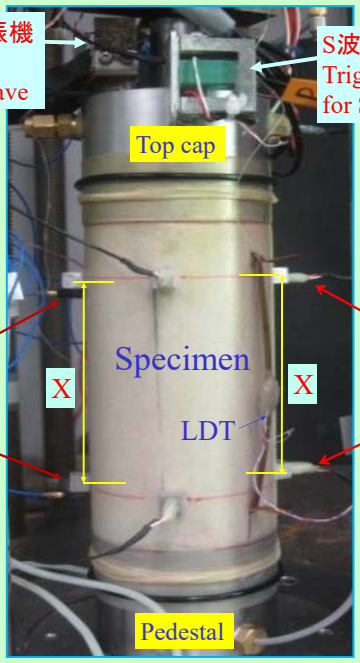
TEST ON TOYOURA SAND

Function Generator

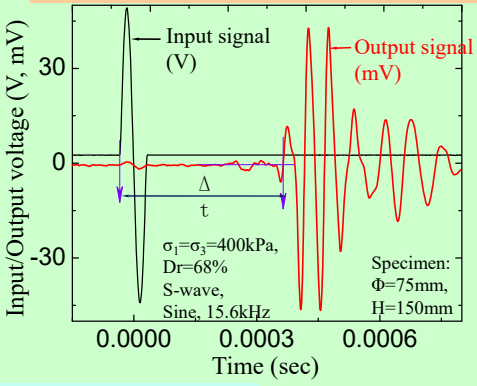
送信波
Input wave

Typical waveform by Bender Element





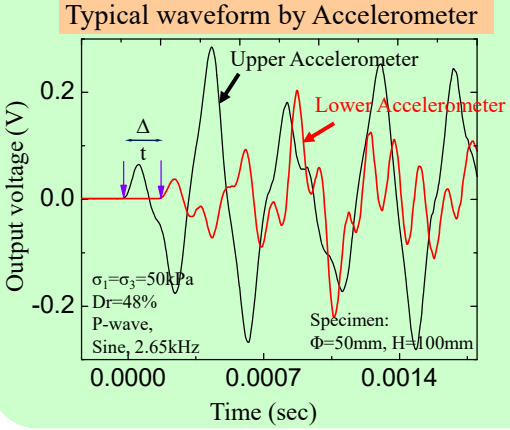
Typical waveform by Disk Transducer



加速度計
Accelerometer

バイモルフ素子による受信
Bimorph element receiver

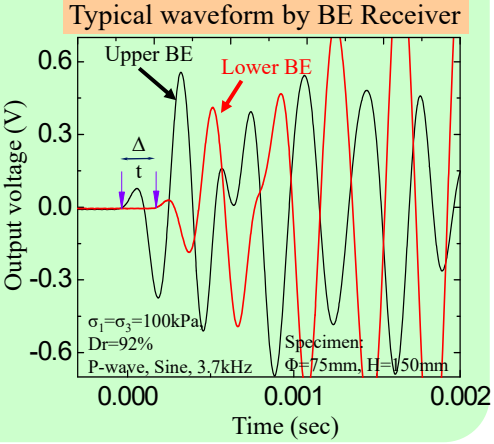
Typical waveform by Accelerometer



Oscilloscope

送信波と受信波の取得
Monitoring of input and output signal

Typical waveform by BE Receiver



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