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(L/D)

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LVDT

(Oven)

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[ ] ASTM

( ) [ ]

[ ] (ISRM)

L/D

L/D

(L/D)

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$$E_d = \rho V_s^2 \frac{(3V_p^2 - 4V_s^2)}{(V_p^2 - V_s^2)}$$

( L/D )

$$G_d = \rho V_s^2$$

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$$v_d = \frac{(V_p^2 - 2V_s^2)}{2(V_p^2 - V_s^2)}$$

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$v_d$   $G_d$   $E_d$

[ ]

$\rho$   $V_s$   $V_p$

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/ / /

[ ]

L/D

OYO

Sonic-Viewer-SX

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L/D ( )  
 (m/s)

R

L/D

$$V_s = \left( \frac{L}{D} \right) + \left( R = \frac{L}{D} \right) \quad ( ) \quad ( )$$

$$V_s = \left( \frac{L}{D} \right) + \left( R = \frac{L}{D} \right) \quad ( )$$

$$V_s = \left( \frac{L}{D} \right) + \left( R = \frac{L}{D} \right) \quad (V_s)$$

$$V_s = \left( \frac{L}{D} \right) + \left( R = \frac{L}{D} \right) \quad ( )$$

L/D  
L/D

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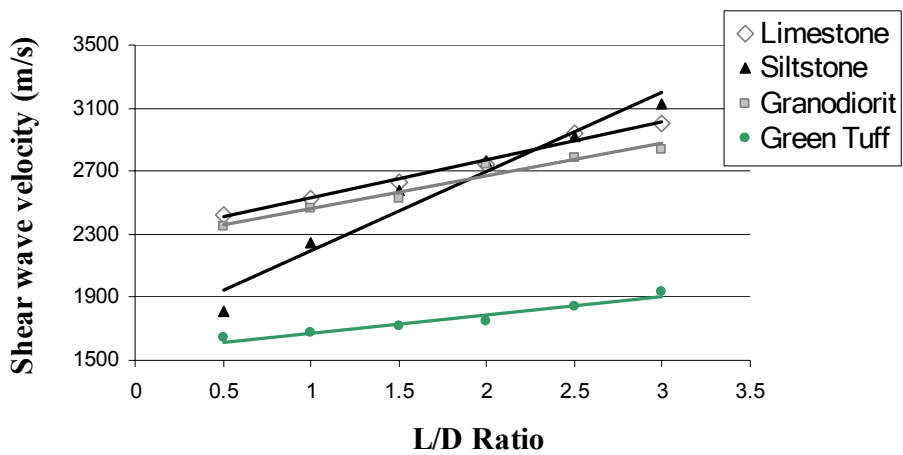
		(gr/cm <sup>2</sup> )	(gr/cm <sup>2</sup> )		
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L/D

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	(GPa)	(GPa)	(m/s)	(m/s)		(GPa)	(GPa)	(m/s)	(m/s)	
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	(GPa)	(GPa)	(m/s)	(m/s)		(GPa)	(GPa)	(m/s)	(m/s)	
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(m/s)

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$$G_d = \frac{L}{D} + \dots \quad (R = \dots)$$

**(E<sub>d</sub>)**

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$$G_d = \frac{L}{D} + \dots \quad (R = \dots)$$

L/D

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**(v<sub>d</sub>)**

L/D

L/D

(GPa)

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L/D

$$E_d = \frac{L}{D} + \dots \quad (R = \dots)$$

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$$E_d = \frac{L}{D} + \dots \quad (R = \dots)$$

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$$E_d = \frac{L}{D} + \dots \quad (R = \dots)$$

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$$E_d = \frac{L}{D} + \dots \quad (R = \dots)$$

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$$v_d = - \frac{L}{D} + \dots \quad (R = \dots)$$

**(G<sub>d</sub>)**

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$$v_d = - \frac{L}{D} + \dots \quad (R = \dots)$$

L/D

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$$v_d = - \frac{L}{D} + \dots \quad (R = \dots)$$

L/D

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L/D

$$v_d = - \frac{L}{D} + \dots \quad (R = \dots)$$

(GPa)

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**(V<sub>p</sub>)**

$$G_d = \frac{L}{D} + \dots \quad (R = \dots)$$

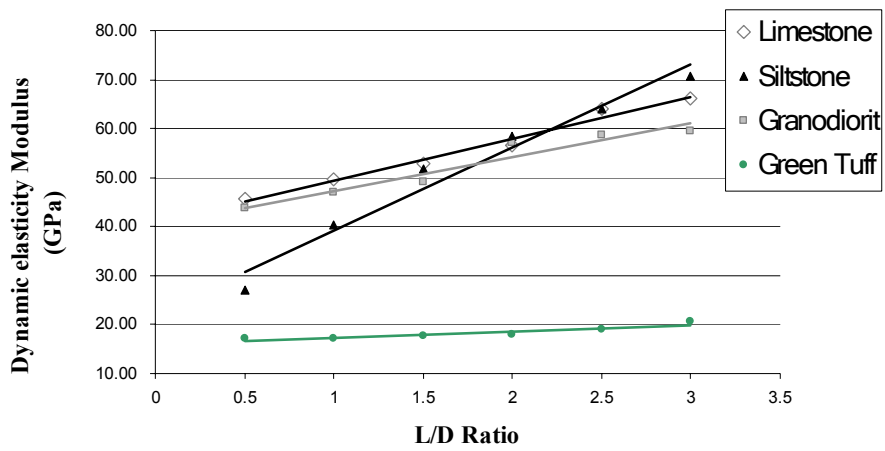
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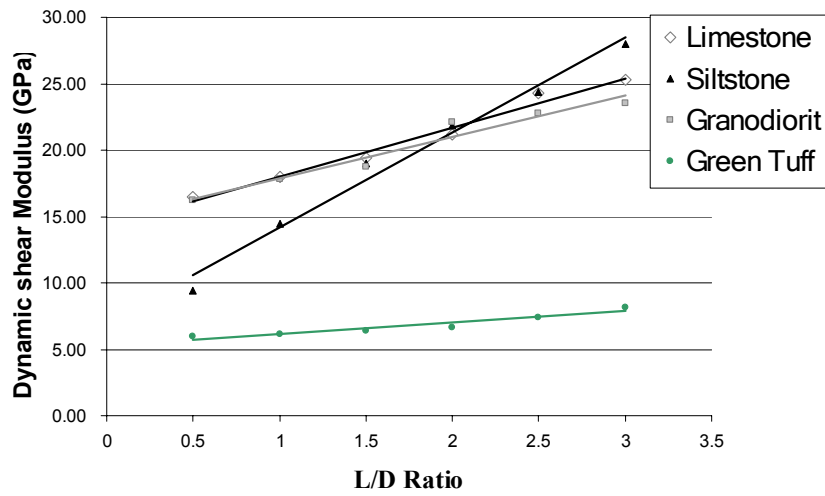
L/D

$$G_d = \frac{L}{D} + \dots \quad (R = \dots)$$

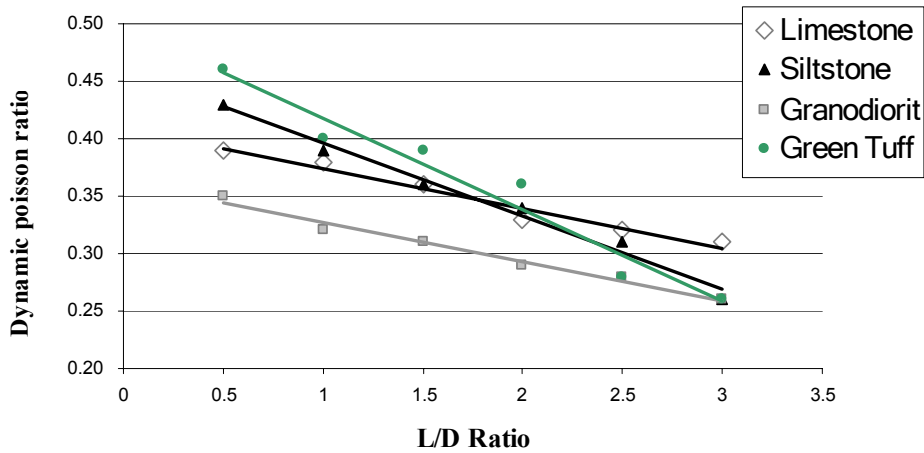
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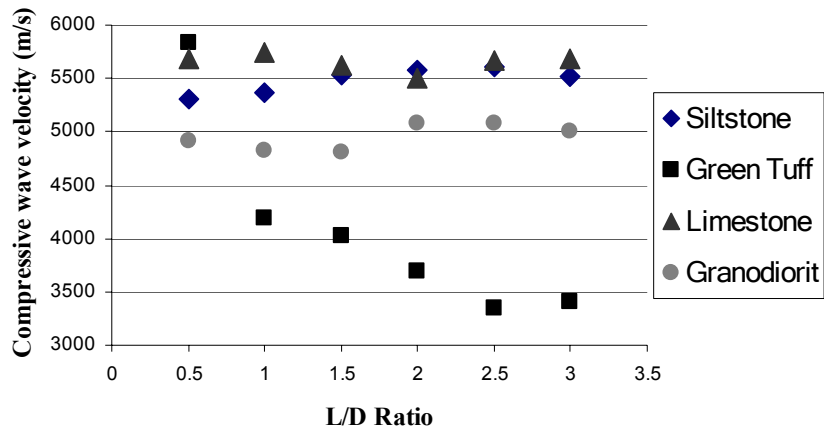
.(GPa) :



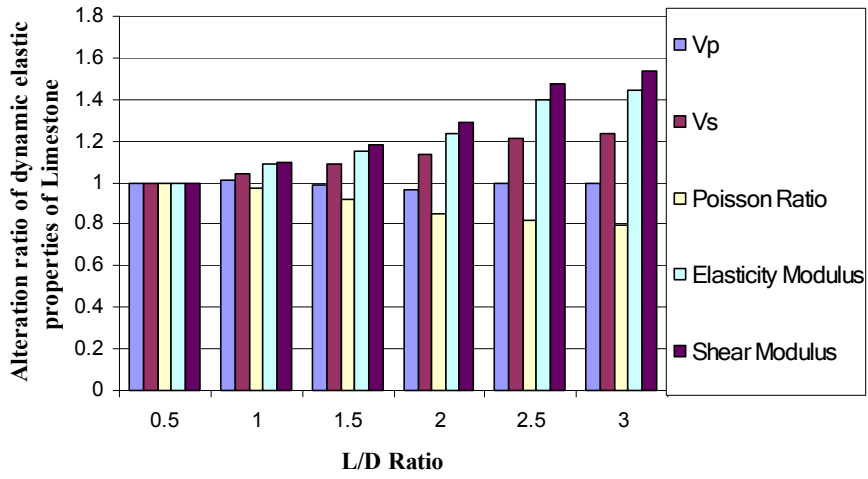
.(GPa) :



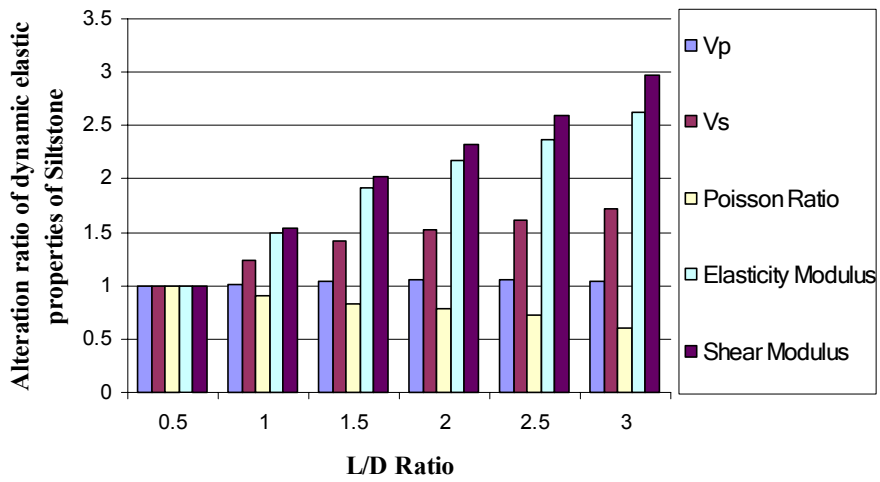
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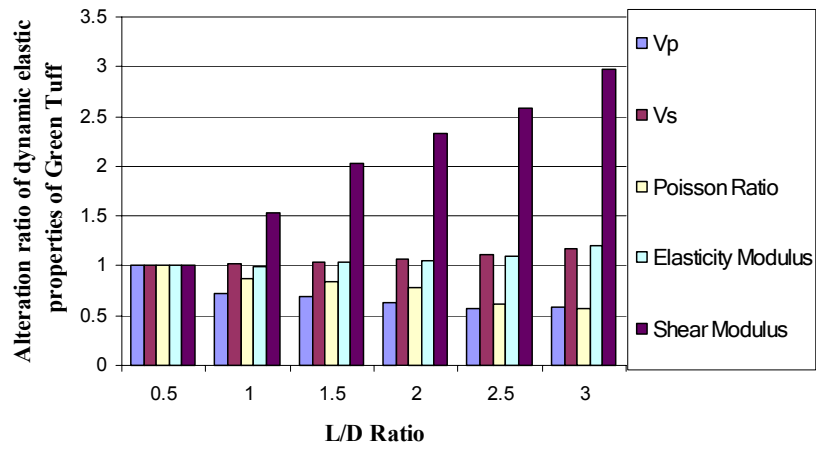
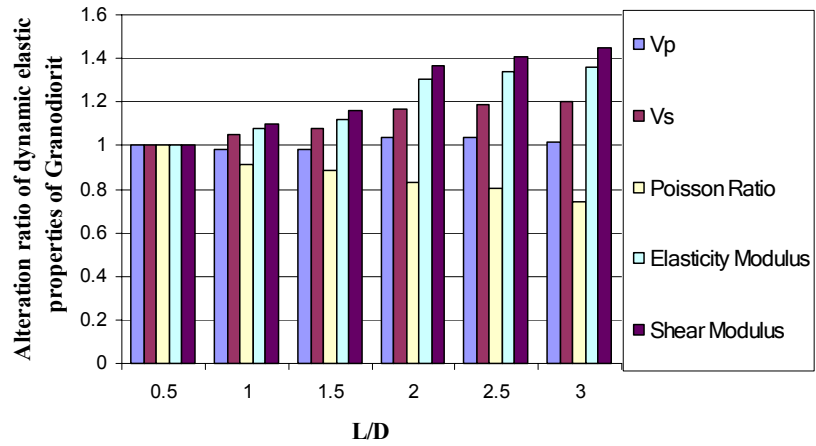
.(m/s) :



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ISRM ASTM

L/D

L/D

ASTM

Vs



L/D

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- 1 - Linear Variable Differential Transformer
  - 2 - Strain Gauge
  - 3 - Transducers
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