

Automated environment controllable stress-controllable 7D soil column for measuring transient hydraulic properties



- ◆ /
- ◆
- ◆ SDPFs SDSWCCs
- ◆ SDPFs SDSWCCs
- ◆ ,  $K_0$
- ◆ SDPF
- ◆ SDSWCC



Geo-Experts

IPM  
SDPF

$h_{z_i,t_j}$   
and D)

$t_j$  ( $j = 1, 2$ )

$z_i$  ( $i = A, B, C$

VWC

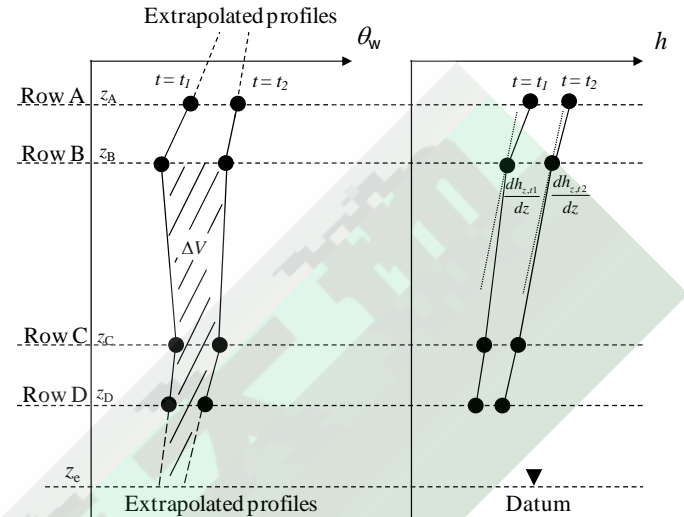
PWP

SDSWCC

PWP

VWC

LVDT



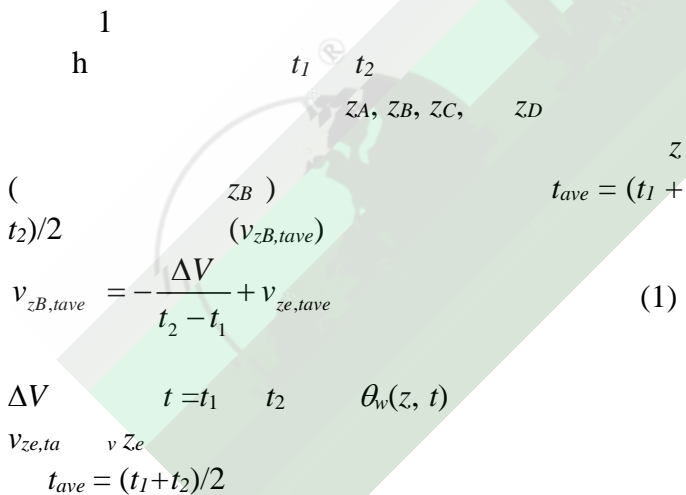
- IPM

1.

$t = t_1 \quad t_2,$   
(Ng & Leung 2012)

$$k_{zB,tave} = - \frac{v_{zB,tave}}{i_{zB,tave}} \quad (3)$$

Geo-Experts



$$v_{zB,tave} = - \frac{\Delta V}{t_2 - t_1} + v_{ze,tave} \quad (1)$$

$$t_{ave} = \frac{t_1 + t_2}{2}$$

(Mariotte's bottle.)

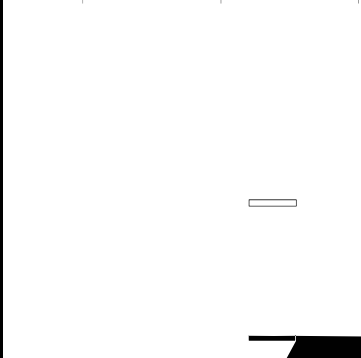
1  $v_{ze,tave}$

$i_{zB,tave},$

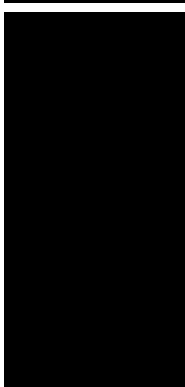
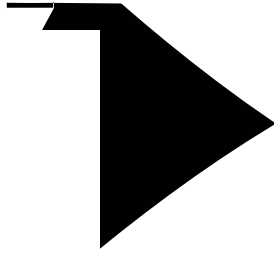
:\

$$i_{zB,tave} = \frac{1}{2} \left( \frac{dh_{zB,t1}}{dz} + \frac{dh_{zB,t2}}{dz} \right) = \frac{1}{4} \left[ \left( \frac{h_{zA,t1} - h_{zB,t1}}{z_A - z_B} + \frac{h_{zB,t1} - h_{zC,t1}}{z_B - z_C} \right) + \left( \frac{h_{zA,t2} - h_{zB,t2}}{z_A - z_B} + \frac{h_{zB,t2} - h_{zC,t2}}{z_B - z_C} \right) \right] \quad (2)$$

SDSWCCs SDPFs



—





1	*		: 150 mm
			: 190 mm
			: 1000 mm
2	<b>VWC</b>		: 60 mm
3			: 5 mm
4	( )		
i	<i>k</i>		: 150 mm
			: 200 mm
ii			: 5 kg
			: 0.01 g
5			: 10 kN
			: 50 mm
			: 0 – 450 kPa
			: 0 – 1000 kPa
6	( )		: 2 MPa
			: 0.5 mV/V
			: 2 % RO
			: 1 channel, 4 dig

\* ) ( )  
 \*\* VWC PWC 6.

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