

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



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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

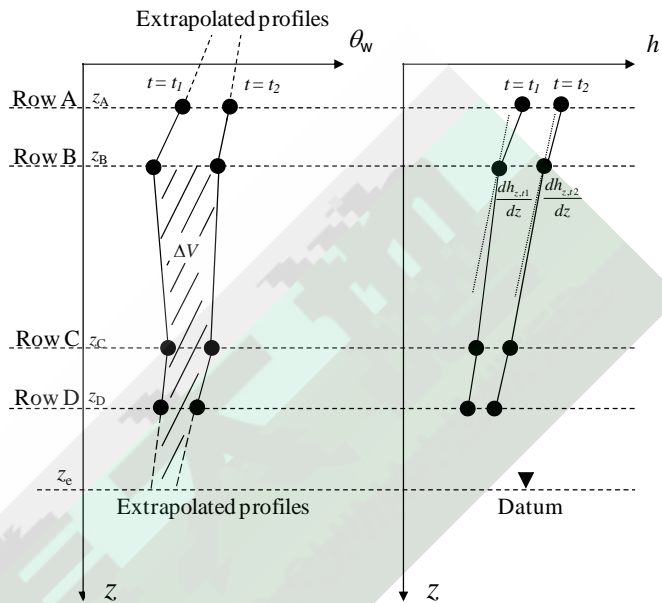
PWP

SDSWCC

PWP

VWC

LVDT



- IPM

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

Geo-Experts

1
h

t_1 t_2
 z_A, z_B, z_C, z_D

$t_{ave} = (t_1 + t_2)/2$

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

ΔV $t = t_1$ t_2 $\theta_w(z, t)$

$v_{ze,tave} = v_{ze}$

$t_{ave} = (t_1 + t_2)/2$

(Mariotte's bottle.)

1 $v_{ze,tave}$

$i_{zB,tave}$

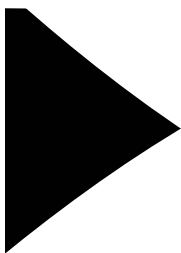
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$$i_{zB,tave} = \frac{1}{2} \left(\frac{dh_{zB,t1}}{dz} + \frac{dh_{zB,t2}}{dz} \right)$$

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

$V_{ze,tave}$

4



1	*				
				: 150 mm	
				: 190 mm	
				: 1000 mm	
2	VWC			: 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	

*) 6. ()
 ** VWC PWC

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