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Water balance: deep drainage , including water flow in unsaturated soil 1

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A SOFTWARE TO CALCULATE SOIL HYDRAULIC CONDUCTIVITY FROM INTERNAL DRAINAGE EXPERIMENTS

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- EXPERIMENTAL SET – UP

- Leveled bare soil plot (square 3 x 3; 5 x 5; 10 x 10m, circular with double rings, …)
- Neutron access tubes to measure soil water contents θ at desired depths and times (or Time Domain Reflectometers TDR, or tensiometers with soil water retention curves to convert h into θ).
- Tensiometers to measure matric soil water potential at desired depths and times.
- Large quantity of water to flood the area until steady – state infiltration.
- Plastic sheet to cover the area.

- INFILTRATION

Flood the area antil steady – state infiltration, measuring í until a constant value is reached:

$$i = \frac{h_2 - h_1}{t_2 - t_1}$$

at steady – state:

- measure $\theta_{sat} = \theta_0$ at each selected depth
- $í = K_0 = K_{sat}$ = saturated hydraulic conductivity

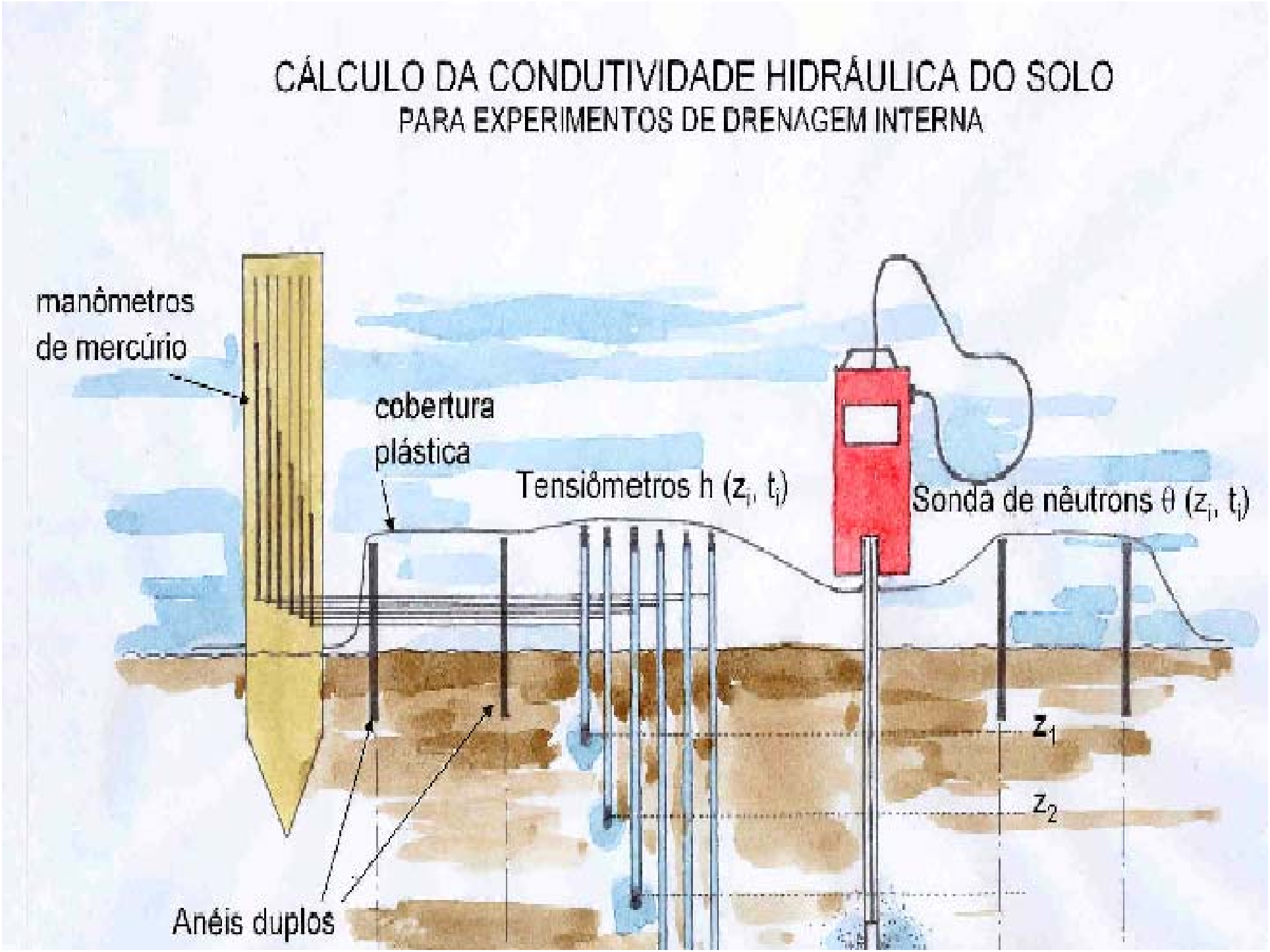
Models: $K = K_0 \exp \beta (\theta - \theta_0)$ or $K = \alpha e^{\beta\theta}$

- REDISTRIBUTION (Internal Drainage)

Cover area with plastic sheet (t = 0) and start measuring θ and h at select times t at selected depth z.

Organize EXCELL tables with θ (z, t) and h (z, t) data, which are the inputs for the software.

CÁLCULO DA CONDUTIVIDADE HIDRÁULICA DO SOLO
PARA EXPERIMENTOS DE DRENAGEM INTERNA



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- USE OF THE SOFTWARE

The software is obtained at no cost with Prof.Dr. Durval Dourado Neto:
dourado@esalq.usp.br