

Soil hydraulic characteristics

With use of RETC plot the retention and hydraulic conductivity curves for two soils

1. Based on the data for two soils (given in tables on next slide), determine the van Genuchten's parameters of retention curve. Use van Genuchten's ($m=1-1/n$) model for retention curve and Mualem's model for conductivity curve.
2. Plot retention curves and hydraulic conductivity curves for both soils
3. Decide, which soil is loamy and which is sandy.
4. According to given tensiometer's measurements (see the 3rd slide), plot pressure head (h), hydraulic head (H), moisture content and hydraulic conductivity profiles.
5. Based on the plots from previous point, decide the water flow direction (upwards or downwards)?

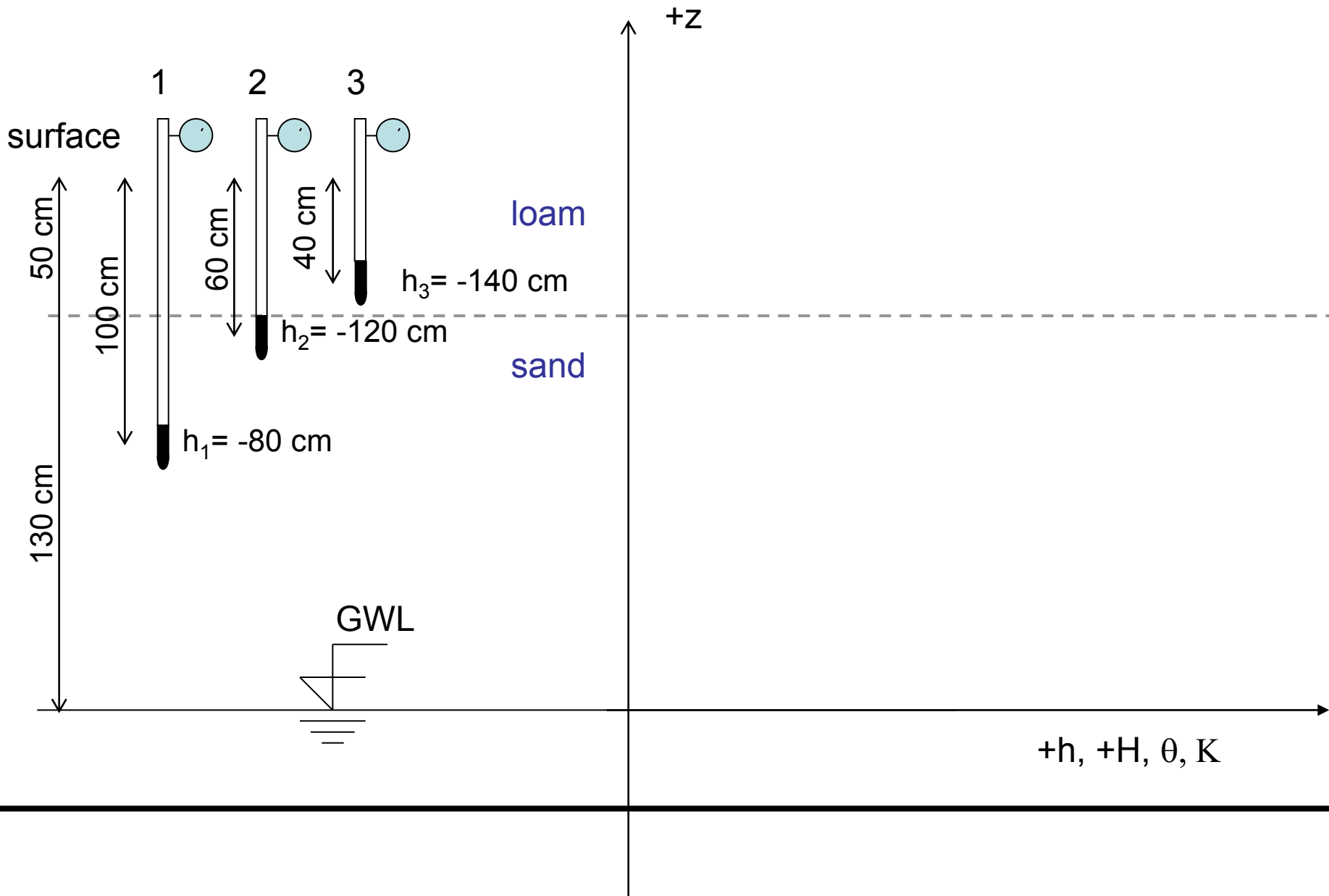
Soil hydraulic characteristics – measured points of retention curve

SOIL 1

h (cm)	Water cont.
1	0.365
10	0.232
30	0.177
58	0.149
89	0.137
500	0.119
6000	0.107
Ks = 280 cm/day	

SOIL 2

h (cm)	Water cont.
1	0.310
10	0.268
30	0.241
58	0.199
89	0.177
500	0.152
6000	0.137
Ks = 65 cm/day	



If you were not present at the seminar, include the “RETC results” screenshot in your report

The screenshot shows the RETC software interface. The main window has a menu bar (Project, Input, Execute, Results, View, Window, Help) and a toolbar. The left sidebar lists pre-processing steps: Type of Problem, Scale Units, Type of Retention/Conductivity, Soil Hydraulic Parameters, and Retention Curve Data. The right sidebar lists post-processing options: Graph of Soil Hydraulic Properties and RETC - Output ASCII File. A red circle highlights the file name 'example.es' in the title bar. A red arrow points from the text 'your name' to the 'Results' menu item. Another red arrow points from the text 'results' to the 'Output File' window.

Output File

```
*****
*
*   Analysis of soil hydraulic properties
*
*   Welcome to RETC
*
*   Mualem-based restriction, M=1-1/N
*   Analysis of retention data only
*   MType= 3      Method= 3
*
*****

Initial values of the coefficients
=====
No      Name      Initial value  Index
1      ThetaR      .0780         1
2      ThetaS      .4300         1
3      Alpha       .0360         1
4      n           1.5600        1
```

OK