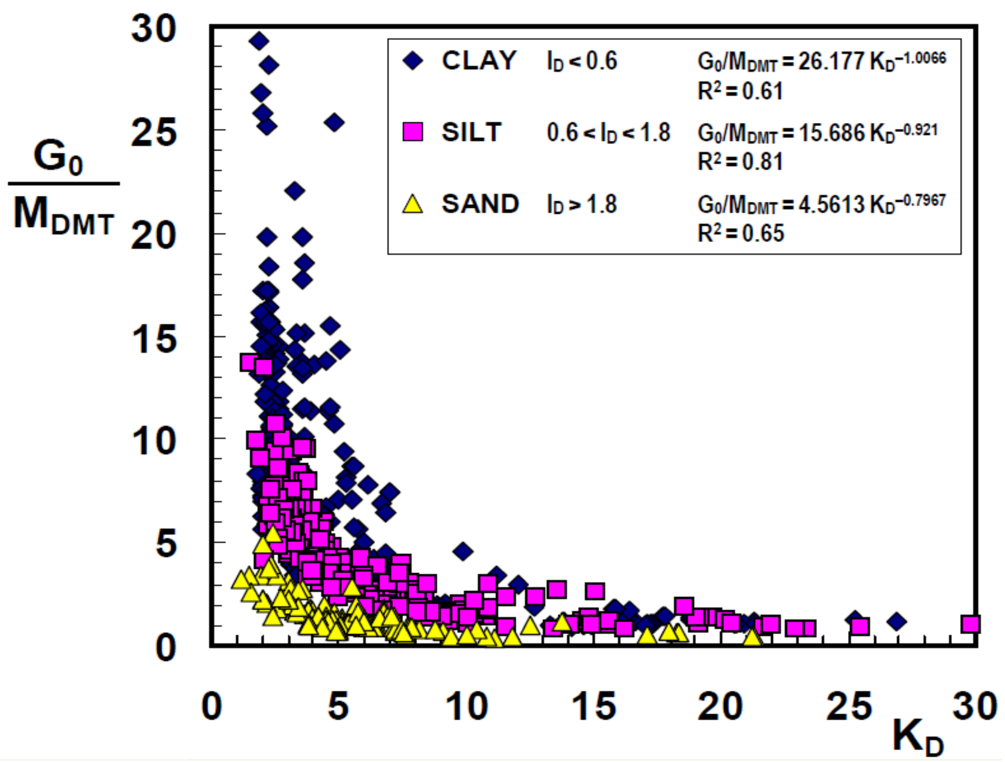
Diagram permiting an estimation of Go (Vs) from traditional DMT data (i.e. Go= f (Id, Kd, Ed).



At depths where only mechanical DMT results are available and Vs has not been measured, approximate estimates of Go can be obtained from I_D , K_D , M_{DMT} using the diagram above.

The diagrams are based on 2000 datapoints obtained by Seismic Dilatometer (SDMT) at 34 mostly sedimentary sites in various parts of the world (°).

It can be seen that the ratio Go/M_{DMT} is minimum in sands, especially in dense sands (Go/M_{DMT} =1 to 3), and is maximum in clays, especially in NC or lightly OC clays (Go/M_{DMT} = 5 to 25).

Vs can then be derived from Go using the theory of elasticity formula Go = ρ Vs^2. The datapoints in the diagrams permit an evaluation of the degree of approximation of the estimates.

(°) Reference: Marchetti S., Monaco P., Totani G. and Marchetti D. "**In Situ Tests by Seismic Dilatometer (SDMT)**", ASCE Geotechnical Special Publication honoring Dr. John H. Schmertmann. FROM RESEARCH TO PRACTICE IN GEOTECHNICAL ENGINEERING. GSP No. 170, 2008

NOTE. The above referenced paper contains also diagrams similar but having in the ordinates the ratio G_0/E_D rather than G_0/M_{DMT}. The degree of correlation was found to be lower. Hence the above diagrams appear preferable for estimating Go and Vs.

The diagrams in the next page (Nuno Bravo Thesis, 2010) indicate that **in residual (cemented) soils, Go (or Vs) are considerably higher than in sedimentary soils. Hence this higher position may help in detecting cohesion / cementation / residual soils**.

Nuno Bravo de Faria Cruz (2010) Thesis : "Modelling Geomechanics of residual Soils with DMT tests". p.414

As a consequence of these data analysis, it becomes clear that both [G_0/E_D vs. I_D] and [G_0/M_{DMT} vs. K_D] can be used to detect the presence of cementation. Even though they can be used separately, it is suggested their combined use to have a redundant classification with the required input data coming from similar test origins same.

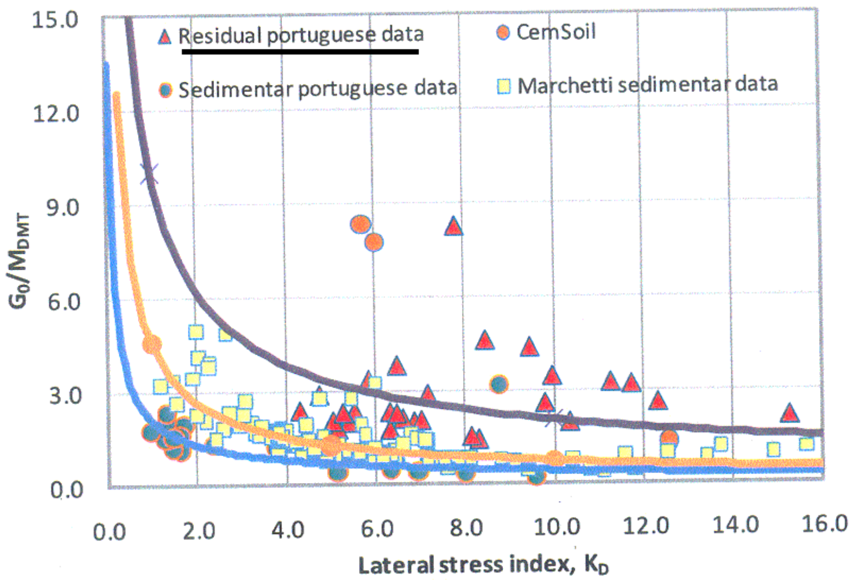
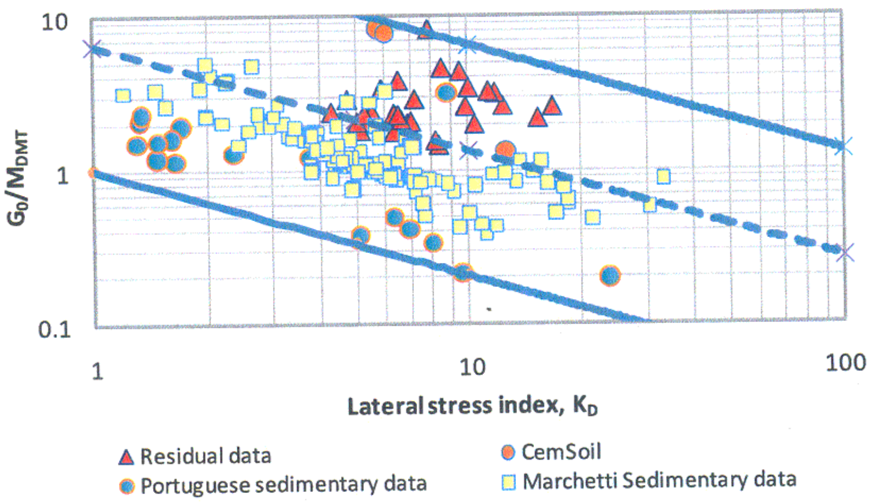


Figure 10.69 - Residual and sedimentary sand data in G_0/M_{DMT} vs. K_D space.



same plot, but log scale for Kd

Figure 10.70 - Upper and lower bounds for residual and sedimentary sandy soils, in G_0/M_{DMT} vs. K_D plot.