Soil moisture sensor calibration for organic soil surface layers

S. Bircher et al., *Geosci. Instrum. Method. Data Syst. Discuss.*, 5, 447–493, 2015

Very interesting paper, useful for users, maybe too long as presented (some parts, describing details on samples, could be placed in appendix). The results appear very coherent and robust (between lab and field, between samples and between instruments).

The main concern is about when in practice must we use mineral or organic calibration curve? The transition between the two types of samples is not clear. You only present the results separately with an arbitrary threshold of 30% SOM. Page 463, you mentioned another limit of 10% SOM? There is unfortunately no direct analysis as a function of organic matter, only colors in Figure 2. In other words, for which SOM value (or range of values) the 2 calibration curves for mineral and organic soil match together? Maybe, an additional figure showing the transition between both curves could help the users?

Discussion (comparison?) with the Mironov's model should have been interesting.

Form: In the text describing the Figures, try to give the corresponding symbols and colors used in the figures. This will make easier to follow what you speak.

In Figure 4: explain the green curves?

We did similar measurements with a similar protocol and with the same sensor (Decagon 5TE) and also with another Decagon sensor GS3. Our sample comes from James Bay area (boreal – subarctic post-glacial soil type). Unfortunately, we don't know the SOM?

The results (Fig. R1) of this limited analysis (only one sample and 2 sensors) show, as expected, that the calibration curve depends upon the type of sensor used (GS3 vs 5TE). The comparison against the results from the new proposed curve (red line "Bircher") shows in Fig. R1 that our sample should be more mineral than organic?

This outlines the fact that the transition between more or less organic matter amounts is important.

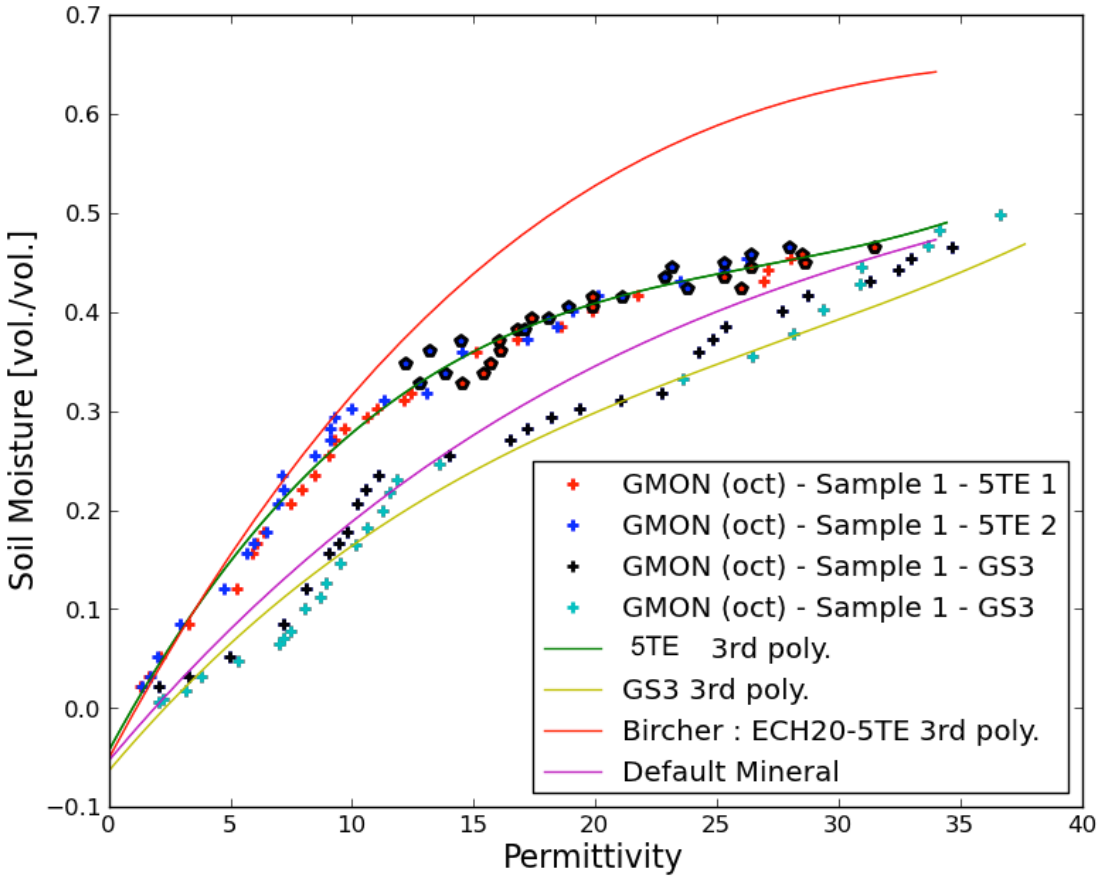

Figure R1. Calibration curve for the Decagon devices GS3 and 5TE for a sample collected in James Bay area (Canada). The different colors (+) correspond respectively to the sample not perturbed and to the sample mixed, showing that to mix the sample does not change the results. The black points correspond to progressively wetting the sample toward saturation (black pentagons), instead of drying it (starting from saturation) (symbol: coloured +). The 3rd degree Polynomial curves are compared (Table 1 5TE from Bircher et al.)