



In-situ soil colour measurements for palaeosol detection

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Colour determination with Munsell Soil Colour Charts is a common parameter for field description of recent soil and palaeosol sections. The Munsell system is based on human cognition of colour and not a quantitative measure of visible light. Furthermore one of the three variables (Hue) is a categorial one. These limitations of the Munsell system can be overcome with other colour space models like CIELAB, CIELUV or CIELCH. All colour models are based on numerical Cartesian or polar coordinate systems and so statistical analysis are possible [Rossel et al., 2006].

Using a handheld spectrophotometer (ColorLite Sph 850), the spectral range is limited from 400 to 700 nm. Measurements were done with standard illumination D65 and an observer angle of 10°. The calibration of the instrument was carried out with a certified white standard in the field.

We measured three loess-palaeosol-sequences spaced at equal intervals, all sections are located in Lower Austria. The sections of Grub Kranawetberg and Krems Wachtberg are palaeolithic sites, both cultural layers are dated around 25 ka BP and buried with several loess layers. Stillfried B is part of the standard section for the dry loess region in Lower Austria of the Late Pleistocene MIS 3. We compare the results with standard parameters like magnetic susceptibility, total organic carbon, carbonate content, iron-oxides and grain size to gain insight the sensitivity of this quick and easy method. First results show higher resolutions of colour measurements than standard parameters provide.

References

- [Rossel et al., 2006] Rossel, R.A.V., Minasny, B., Roudier, P. and McBratney, A.B., 2006: Colour space models for soil science. *Geoderma*, 133, pp. 320-337.