



Are magnetic properties a possible proxy of the carbon content in soil?

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Soil magnetic properties records various phenomena that intervene during the pedogenesis. These permit thus to discriminate palaeosol from loess (e.g. loess/palaeosol sequences in China). If we focus on organic matter content and biochemical processes, we can consider that a high OM content increases bacterial activity. This activity can correspond to measurable changes in one of two measurable magnetic properties, magnetic susceptibility and/or magnetic viscosity. It is thus interesting to assess if maps of magnetic properties correlate with carbon content.

As the carbon content of soil varies mostly with the agricultural processes applied, two sites with a small extent but gathering several processes have been investigated.

The magnetic susceptibility and viscosity were mapped using several depths of investigation. These measurements allowed us to evaluate the magnetic grain size distribution. The different agricultural processes applied on the studied soils are:

- Grassland,
- ploughing and cultivating for a decade,
- ploughing and cultivating for a year.

The carbon content maps of these different areas were compared with the magnetic properties maps and the results are presented.