

Error propagation in spectrometric functions of soil organic carbon

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Soil organic carbon (SOC) plays a major role concerning chemical, physical and biological soil properties and functions. In order to get a better understanding on how soil management affects the SOC content, the exact monitoring of SOC on long-term field experiments (LTFE) is needed. Visible and near infrared (Vis-NIR) reflectance spectrometry is an inexpensive and fast technique to enhance conventional SOC analysis and has often been used to predict SOC. For this study, 100 soil samples were collected on a LTFE in central Germany by two different sampling designs. Regression models were built using partial least square regression (PLSR). In order to build robust models, 10-fold cross-validation was applied for the model tuning and validation procedure. Various aspects that influence the obtained error measure were analysed and discussed. Overall, a transparent and precise documentation of the model building and validation procedure is necessary in order to assess and compare model accuracy in a comprehensive way.