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Application of Raman spectroscopy combined automated 2D image analysis for geosciences

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Particle size and shape analyses are fundamental measurement in several fields of geosciences. While particle sizing is based on laser diffraction since second half of 90's, shape characterization is mostly based on optical microscopy. (Some of studies apply scanning electron microscopy (SEM), as well). Both techniques for particle shape characterization allow only studying limited number of grains.
Morphologi G3ID is an automated particle shape analyser which is combined with a Kaiser Rxn1 Raman spectroscope. This instrument provides an option for parallel sizing, shape characterization and the determination of mineral properties of each individual particles. The automated 2D image analysis provides characterization of large number (hundreds of thousands) grains.
Morphologi software has abilities for statistical analysis of studied particles. It has an option to compare different samples using cluster analysis.
Our presentation focuses on the application of this system for geosciences. We provide an overview about new dimensions of the particle characterization from different kinds of materials: unconsolidated materials (e.g. windblown mineral dust, red clay, soil) and polished surface of rock samples (e.g. sandstone particles vs pores). We introduce the application Morphology software for SEM images, as well.

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