Meteorite spectrometry using the University of Helsinki Vis-SWIR spectrometer Helsinki Vis-SWIR spectrometer

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Asteroids provide us information on the evolution of the Solar System. Meteorites and asteroids can be linked by matching their respective reflectance spectra. However, this is difficult because spectral features depend strongly on the surface properties. In order to better interpret the reflectance spectra, we need to gain more knowledge of the light-scattering physics involved.

We have utilized the University of Helsinki integrating-sphere Vis-SWIR spectrometer to measure the reflectance spectra of 30 different meteorite pieces. The wavelength ranged from 300 to 2500 nm. The measured spectra were further analyzed with the PCA (Principal Component Analysis), which can be a useful statistical tool for studying and classifying spectra. We compare our data set with the data sets obtained by Pentikäinen et al. (JQSRT, 2014) and Paton et al. (JQSRT 112, 2011). The reflectance spectra found in all three data sets have similar features. These measurements give us better tools for future light-scattering research on meteorite surfaces.

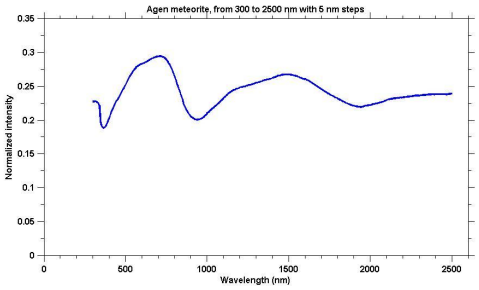

Figure: We show the integrating-sphere spectrometer, an example piece of a meteorite, and the corresponding spectrum measured.