

L06. Is hyperspectral imaging an analytical instrument?

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Hyperspectral imaging in the near infrared in the laboratory is now a possible but expensive and slow reality. Images of reasonable sizes (256x320 pixels) can be made where every pixel is a spectrum of 120 wavelengths in the region 950-1650 nm. The images have the properties of visual interpretation, but do they also have the same properties as an analytical instrument giving a bulk spectrum between 400 and 2500 nm? What are the advantages and disadvantages of images compared to reflectance spectra? What are the issues of calibration and instrument setup? How does sampling come in?

The role of different mathematical and statistical modeling techniques will be highlighted. Chemometrics has a major role to play in getting things right when hyperspectral imaging is concerned. Some examples are given of how imaging models can be made and how they can be interpreted.

References:

1. Geladi P & Grahn H, *Multivariate Image Analysis*, Wiley, Chichester, 1996, ISBN 0-471-93001-6.
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3. Burger J & Geladi P, *Hyperspectral NIR Image Regression Part I: Calibration and Correction*. *Journal of Chemometrics*, 19, 355-363, 2005.