USE OF AVIRIS DATA TO THE DEFINITION OF OPTIMISED SPECIFICATIONS FOR LAND APPLICATIONS WITH FUTURE SPACEBORNE IMAGING SPECTROMETERS

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Recent experience with airborne imaging spectrometers has demonstrated the advantages of narrow band sensors over broad band scanners for characterising the nature, extent and physical status of typical land surfaces. Information on key spectral features associated with various land surfaces can be obtained from the data of such instruments, which can be used to simulate spaceborne imaging spectrometer data and to assess their information content if comprehensive underpinning is provided by ground data.
The collection of such information has been an issue of airborne imaging spectrometer campaigns like the NASA MAC-Europe 1991.
In the presented study airborne and ground data obtained from different test sites in Europe are utilised for a comparative analysis of the spectral signatures of various land surfaces (vegetation, bare soils and rocks, mixed soil/rock - vegetation) as seen from different imaging spectrometers like AVIRIS, GERIS 63 band scanner and CASI. The following items are discussed:

- the significance of different spectral regions within the wavelength interval between 0.4 m and 2.5 m for the differentiation of different land units.

- recommendations on the optimum band selection and band-widths to be used for the application of future satellite-based imaging spectrometers for land applications.

- the boundaries for the detection of plant features in mixed-soil plant spectra and the influence of different soil properties on the mixture of the spectra.

- recommendations on the optimum spatial resolution and recording dates for the discrimination of spectral features of various surface types.

- evaluation of different data compressing techniques for the optimum extraction of spectral information from imaging spectrometry data.