



An approach to address the issues related to cross-calibration and atmospheric correction of IMS-1 HySI data

Manu Mehta and Shefali Agarwal

Photogrammetry and Remote Sensing Division, IIRS, Dehradun

Email: manu@iirs.gov.in ; shefali_a@iirs.gov.in

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Abstract: An accurate analysis of hyperspectral data for Earth observations can be performed only when atmospheric effects are minimized. With a view to study the capability for landuse/landcover feature identification, IMS-1 HySI data was atmospherically corrected using FLAASH and ATCOR. The resulting image yielded reflectance spectra which showed mismatch with the ground recorded spectral profiles due to which the analysis done over this imagery is subject to errors. This study presents an approach by which the resulting output reflectance profiles from HySI fairly match with those of ground profiles. The procedure involves the cross-calibration of HySI data with respect to Hyperion data for an overlapping area. Pseudo-invariant features were chosen as the reference pixels for cross-calibration. Three methods of cross-calibration have been considered. It is seen that the output spectra obtained by this approach are comparable to the Hyperion spectra as well as to the ground spectra. The calibration constants were applied to the other HySI image of the same area for a different date of acquisition and the results are again compared with the ground profile. The mismatch in the results can be attributed to differences in relative spectral response curves for the two sensors, atmospheric and solar illumination conditions, errors in geometric co-registration, viewing geometry (BRDF effects) and the effect of mixed pixels in HySI imagery.

Keywords: HySI, atmospheric correction, cross-calibration, FLAASH, ATCOR