

## Analysis and Reflectivity Inversion from Hyperion Hyperspectral Image

LIANG Ji<sup>1,2</sup> and WANG Jian<sup>1</sup>

<sup>1</sup>Cold and Arid Regions Environmental and Engineering Research Institute,  
Chinese Academy of Sciences, Lanzhou, 730000

<sup>2</sup>Graduate University of Chinese Academy of Sciences, Beijing, 100049

This article has aimed at (1) the processing to EO-1 Hyperion image at the Qilian mountainous area on March 17, 2008, and (2) snow reflectivity inversion using atmospheric radiative transfer model (MODTRAN4), and (3) validation and accuracy assessment of retrieval snow reflectivity though comparison with snow sample spectra data which measured in-situ field synchronization, and the snow reflectivity which derived from WW (Wiscombe-Warren) model. First, EO-1 Hyperion image has hundreds of effective bands which can fully show the spectrum curve for each pixel, then we can discriminate among the surface features according to the spectral difference, owing to surface features has different spectral response characteristics in different bands. The analysis and processing to the Hyperion hyper-spectral image include radiation calibration, bad lines, strips, and spectral smile effect, and so on. Second, by using MODTRAN, the in-situ observation atmospheric data and snow surface synchronization reflectivity data together, the image has been calibrated atmospheric effect and acquired the reflectivity map which become basis data for the further inversed work, such as extracting the area of snow cover, snow grain size, and snow surface albedo. Third, validation and accuracy assessment the inversed reflectivity map. We use two methods to assess and contrast the inversed result with snow sample spectra data which measured in-situ field synchronization, and the snow reflectivity which derived from WW model. We found the assessment result that is the reflectivity values sort to the order of MODTRAN < WW model < snow sample reflectivity from in-situ field measured at 1024nm and 1033nm, and the maximum absolute value of the difference between MODTRAN and in-situ snow sample reflectivity is only up to 0.0335 and 0.03352 at 1024nm and 1033nm on the condition of the pure snow pixel and no-melting snow, respectively. And so we found that the image scale effect impact to the accuracy of parametric inversion.

Corresponding author: WANG Jian

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**LIANG Ji**

Ph.D. Candidate

Cold and Arid Regions Environmental and Engineering Research Institute, CAS 320  
Donggang West Road, LANZHOU, GANSU, CHINA, 730000

Graduate University of Chinese Academy of Sciences, Beijing, 100049

Email: leung@lzb.ac.cn

**WANG Jian**

Ph.D., Professor

Cold and Arid Regions Environmental and Engineering Research Institute, CAS 320  
Donggang West Road, LANZHOU, GANSU, CHINA, 730000

Email: wjian@lzb.ac.cn

