NEW DATA TRANSFORMATION METHOD FOR CBERS-02B MULTI-SPECTRAL IMAGES

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Abstract

CBERS-02B was launched successfully on September 19, 2007, which is developed by the collaboration between China and Brazil on the project of an earth resources satellite. CBERS-02B payloads three sensors: the CCD cameras, including five channels of wave-length from 0.42~0.89 μm, and spatial resolution 19.5 meters; the high resolution cameras (HR), 0.5~0.8μm, 2.36 meters, and the wide field imager (WFI), two channels, 0.63~0.89μm, 258 meters. CBERS-02B CCD multi-spectral images are good potential data sources for remote sensing applications.

LBV data transform equations proposed by Zeng Zhiyuan in 2007, The method has been proved to be applicable for 3 or 4 bands of SPOT, IKONOS and Quick Bird images and also can be extended to 5 bands of NOAA and 7 bands of TM images, however, it is can not be used for the new CBERS-02 B data directly because of the transformation is relied on the specified sensor data. In this paper, one new data transformation method based LBV is specially proposed for CBERS-02B multi-spectral images, which aims to integrate all five channels' information to generate effectively high-quality color composites with detailed colors which are pure, saturated, plentiful, brilliant, information-equilibrated, meaning-definite and close to the colors of ground features in nature. The new transformed images are beneficial to improve the interpretation and discrimination of the ground features when using

CBERS-02B data.

First of all, the analysis of enormous datum of CBERS-02B is carried out to get the variables L which represents for the general radiance level, B the visible–infrared radiation balance and V the band radiance variation vector (direction and speed) which are defined in LBV[Zeng Zhiyuann,2007]. Then the new LBV data transform equations for CBERS-02B data is deduced and the new color composite image generating method is presented. Preliminary experiments are carried for test the proposed method by application to CBERS-02B five channels images to generate new color composite images, compared to the false color composite images only three channels of classical method, the results show that the color composite images of the proposed method are visually more vivid, and the ground features are more enhanced especially for natural types such as soil, water and vegetation, which is helpful of the interpretation and classification of CBERS-02B images. The supervised classification experiment is also done by using the CBERS-02B data covering coastal zone to test the capacity of the proposed method, the overall accuracy of classification experimental results is better compared to the result of directly using no-transform data, which showed the good potential for application of the proposed method.

References

Zeng Zhiyuan, A new method of data transformation for satellite images: I. Methodology and transformation equations for TM images [J], International Journal of Remote Sensing, 2007, 28(18): 4095-4124.