



Remote sensing of aerosols and atmospheric correction of HJ-1 CCD data over urban areas

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Satellite aerosol retrieval over urban areas remains a difficult task due to heterogeneity and high reflectance of the urban ground surface. Compared to most moderate/low resolution satellite sensors for aerosol detection, the high spatial resolution of HJ-1 CCD camera (30 m) enables larger opportunities to find spectrally pure pixels over urban areas. In this study, we developed a SPP (spectrally pure pixels) algorithm for urban aerosol optical depth (AOD) retrieval using HJ-1 CCD data. Pixel Purity Index (PPI) is used to identify the pure pixels on the image. The surface reflectances of the pure pixels are estimated from the multi-temporal CCD measurements of HJ-1A and HJ-1B platforms based on surface BRDF model. Then the aerosol optical depth can be derived from satellite radiation. The comparison with ground-based AERONET (AErosol RObotic NETwork) AOD measurements shows good performance of our algorithm. A significant ($R=0.84$) is obtained with a linear regression slope close to 1 and, however, a relatively large intercept of ~ 0.057 . With the retrieved AOD as input, the atmospheric correction of HJ-1 CCD data over urban areas is largely improved.