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APPLICATIONS OF IMAGE DECONVOLUTION FOR OPTICAL SPACE DEBRIS OBSERVATION

Abstract

According to the dedicated survey strategy and the specialized observing instruments, the imaging degradation in optical space debris observations is ineluctable and distinct. Due to the degradation, the observing efficiency and measurement accuracy are affected, and removing these influences of degradation may promote the ability of surveying space debris, in addition, from the economic aspects, it is an interesting point to improve the detection efficiency and accuracy with current instruments, rather than involving other more telescopes. In our work image restoration is presented as a way to remove the image degradation and improve the astrometric accuracy. In detail, a trial observation is performed and large quantities of raw CCD images are acquired, then the maximum entropy method is adopted in image deconvolution, with point spread function models assumed as well as extracted from the raw CCD data, at last the effects of image restoration are evaluated by comparing the detection efficiency and accuracy. The results of experiments indicate that the influences of image degradation are reduced and the astrometric accuracy of space object is improved, it is effective and feasible to improving the detection of space debris with image deconvolution.