Development and Evaluation of the Optical System Performance applied to Remote Sensing

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The purpose of this paper is to present the optical system developed for the WFI camera that will integrate to the CBERS 3 and 4 satellites. This camera will be used for remote sensing of the Earth and is located at an altitude of 778 km. The optical system is designed for four spectral bands covering the range of wavelengths from blue to near infrared and its field of view is $\pm 28.63^\circ$, which covers 866 km, with a ground resolution of 64 m at nadir. The WFI has been developed through a consortium by companies Opto Electrônica S. A. and Equatorial Sistemas. In particular, we will be presented the optical analysis of the Modulation Transfer Function (MTF) obtained during the preliminary design and optical tests performed to evaluate the requirements. The MTF is a measure of the ability of an optical system of transfer different levels of detail from the object to the image. This is of great importance in the specification and testing of imaging systems to provide an evaluation of the transfer of spatial frequencies from the object to image. Optical system MTF and global MTF tests (including the CCD and signal processing electronic) has been performed using a collimator with a knife-edge target. Optical system MTF test was also accomplished using an interferometer at the wavelength 632nm. The results obtained show that the performance of the optical system meets the requirements of project.