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OPTICAL SYNTHETIC APERTURE IMAGING SYSTEM DESIGN AND ERROR ANALYSIS ON
MICROSATELLITE

Abstract

A multi-aperture optical imaging system is a main way of exploring the space. At present, the diameter of a single primary mirror is limited to about 8 meters, thus the multi-aperture optical imaging can be utilized in the existing large aperture optical telescopes to break the limit. In this paper, we designed an optical synthetic aperture imaging system based on the cubesats with a separate and docking system. The imaging system consisted of six reflective telescopes and one auxiliary optical system. We provided a surface-surface structure instead of the traditional point-point docking system, which could increase the contact area of a satellite docking surface. Furthermore, a ground measurement on air floating testbed indicated that the error in optical synthetic aperture systems could be effectively reduced. Key words: synthetic aperture imaging, separate and docking systems, surface-surface structure