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DESIGN AND ANALYSIS OF A VISIBLE/INFRARED OPTICAL SYSTEM WITH EQUIVALENT EFFECTIVE FOCAL LENGTH

Abstract

This paper presents the design and analysis of a Visible/Infrared optical system with the same effective focal length. Initially, the study utilized a three-mirror anastigmat (TMA) structure known for minimizing major optical aberrations such as spherical, coma, and astigmatism, thus offering relatively wide field of view suitable for various real-world applications.

To comprehensively assess the performance of the optical system, thorough tolerance analysis of the optical components was conducted. This analysis enabled the prediction and improvement of system performance by considering errors and imperfections that may arise during the manufacturing process of each optical element. Moreover, this analysis facilitated the early identification and resolution of potential issues that could occur during the design and manufacturing stages of the optical system.

Through this in-depth performance and tolerance analysis of the optical system, it is anticipated that the designed Visible/Infrared optical system will provide reliable and accurate performance across various application domains in the future.