Abstract

The aim of this thesis is to explore the surface characteristics of space debris utilizing the color photometry approach. With the increasing number of man-made objects orbiting the Earth, studying space debris has become crucial due to the potential dangers they pose to spacecraft and satellites. By comprehending the physical attributes of space debris, we can anticipate their behavior and their impact on our space infrastructure more accurately.

Color photometry is an effective technique for investigating the surface properties of space debris because it provides data on the object's spectral reflectance properties. The spectral reflectance properties of space debris are influenced by various factors, such as the object's composition, surface roughness, and exposure to the space environment. By analyzing the color indices of space debris, we can determine these properties and gain insights into the object's history and behavior.

This thesis will present the methodology employed for obtaining and analyzing color photometry data of space debris, including object selection, observations, and data reduction techniques. The study's findings will be discussed in detail, including the identification of the spectral reflectance properties of the target objects and their implications for understanding space debris behavior. Overall, this thesis aims to enhance our comprehension of space debris surface properties and their dependencies on different aspects as observational geometry, illumination state or age of the object.

keywords:space debris, optical astronomy, BVR_cI_c photometry, object characterisation