ABSTRACT

We present new 1.4-2.5 μm geometric albedo spectra of Charon taken with HST/NICMOS in 1998. These new data provide global coverage of the surface with four spectra at evenly spaced longitudes. The surface of Charon is seen to be globally dominated by H_2O ice. The data indicate the ice is in the crystalline phase at a temperature consistent with its heliocentric distance. The spectrum of Charon has only weak variations with longitude. There is an indication of a slightly stronger H_2O ice absorption on the leading hemisphere. No variations in the spectrum are seen in response to differing solar phase angle. From model fits there is no indication of any of the volatile species that are seen on Pluto, i.e., CO, CH_4, or N_2. There is spectroscopic evidence for a spectral contaminant with an absorption coefficient which increases with wavelength past 2.0 μm. This contaminant is unidentified but is similar to what is seen on other icy satellites in the outer solar system. We also present a standard spectrophotometric model for Charon that can be used to subtract Charon light from ground based spectra of the combined Pluto-Charon system.

Subject headings: Charon, satellites, spectroscopy

1. Introduction

The study of Pluto in the past two decades has revealed a complex and compelling planetary body. This progress in understanding was aided in no small way by the mere presence of its only known satellite, Charon. For all the intricacy and difficulty of observing and modeling Pluto, very little attention has been paid to understanding Charon. This situation isn't one of neglect but a consequence of the extreme observing difficulties in