Effects of faint dust coma on the spectra of asteroids

J. Carvano[1], E. Rondon[1], and S. Lorenz[2]

[1]Observatorio Nacional – Rio de Janeiro, Brazil
[2]Observatorio do Valongo/UFRJ – Rio de Janeiro, Brazil

Nine asteroids of the main belt have shown cometary activity. These objects have been called Main Belt Comets (MBC). The physical source of their activity can be diverse; among the possible causes are collision and sublimation. In this work, we use a dust distribution model associated with the asteroid coma to study the photometric and spectroscopic properties of these objects, from which we can estimate parameters associated with the position of the particle in the coma, the size of the grain, and with the velocity distribution, and thus simulating a collision in the asteroids. We study the influence of grain size on the spectrum of asteroids, using the Hapke model for the sunlight reflected at the surface asteroids and attenuated by the coma, and using the Monte Carlo method for the sunlight scattered by the coma into the line of sight of the observer, following the approach of Carvano and Lorenz (2010) which modeled the effects of a faint dust coma on the asteroid (5201) Ferraz-Mello spectra and other objects. This model was capable of producing an increase in the reflectance in the shorter wavelengths, and they show that the presence of a faint coma produces unusual reflectance. In our model, we study the distribution of the grains produced by the ejection of particles due to volatile sublimation, and we added the effect of the solar phase angle on the spectra.