

NEAR INFRARED OBSERVATIONS OF COMET C/2000 WM1 (LINEAR)

E. Picazzio, A. A. de Almeida, A. R. Lopes and Z. Abraham. Institute of Astronomy, Geophysics and Atmospheric Sciences, University of São Paulo, Rua do Matão 1226, CEP 05508-900, São Paulo, Brazil. E-mail for E.P.: picazzio@astro.iag.usp.br.

Introduction:

Near infrared continuum observations of comets are an important means to study the scattering and thermal emission properties of cometary dust. The infrared spectral distribution is governed by both intrinsic (amount and extent of dust, its production and distribution) and extrinsic (heliocentric and geocentric distances and phase angle) factors [1]. For $\lambda < 1 \mu\text{m}$, the observed light is primarily sunlight scattered by dust grains, while at longer wavelengths, thermal emission from the dust dominates the radiation. The imaging of comets in the infrared can be a powerful method of studying spatial variations in the optical properties of the dust. [2]. Among these properties are scattered radiation, thermal emission, and albedo.

In this work we present preliminary results of near-infrared (IR) observations of the comet C/2000 WM1 (LINEAR) in the period of Dec. 01-03, 2001 (pre-perihelion) and in Apr. 2, 2002 (post-perihelion). Observations were made with the 0.6-m telescope of the Pico dos Dias Observatory (Minas Gerais, Brazil), with filters I (1.10 / 0.200), J (1.25 / 0.285) and H (1.65 / 0.290). Color-indices are analyzed and compared with those for other comets.

Observations and Results:

The near-IR observations were made during Dec. 01-03, 2001 (pre-perihelion) and in Apr. 2, 2002 (post-perihelion) at the Pico dos Dias Observatory (LNA/MCT), Minas Gerais, Brazil. The infrared camera (CamIV) was attached to the 0.60-m (f/13.5) Boller & Chivens telescope. In the pre-perihelion phase the comet and standard stars were observed with filters I (1.10 / 0.200), J (1.25 / 0.285), and H (1.65 / 0.290). The heliocentric and geocentric distances of the comet were 1.214 AU and 0.316 AU, respectively. The corresponding phase angle was 38.6 degrees. Due to the high velocity of the comet in the sky and due to the restrictions in telescope guiding system, the exposures could never exceed 10s.

In the post-perihelion phase the Comet C/2000 WM1 was observed with filters J and H. The heliocentric and geocentric distances of the comet were, respectively, 1.5802 AU and 1.242 AU, and the corresponding phase angle was 41.4 degrees.

In the pre-perihelion phase the I-J color of Comet C/2000 WM1 seems to be similar to C/Kohoutek (1973 E1) and redder than C/Bradfield (1974 C1). This discrepancy is too high to be simply due to filter characteristics. J-H color of C/2000 WM1 seems to be a little bluer, but is similar to some published values for other comets. Also, J-H colors seems to be fairly uniform and independent of the scattering angle.

J-H colors of C/2000 WM1 in the post-perihelion phase is under analysis, as well as coma brightness distribution and morphology.

References:

- [1] Chandrasekhar T. et al. 1996. *Earth, Moon and Planets* 75: 157-167. [2] Woodward C. E. et al. 1996. *Icarus* 124: 651-662.