

PHOTOMETRY OF DISTANT COMET C/2003 WT42 (LINEAR). I. Kulyk¹, P. Korsun¹, ¹Main Astronomical Observatory of National Academy of Sciences, Zabolotnogo Str. 27, 03680 Kyiv, Ukraine, irinakulyk@yahoo.com

Introduction: Comet C/2003 WT42 was discovered by the LINEAR team on November 19, 2003. The present orbit of this comet has a perihelion at 5.19AU and an inclination of 31.4°. In spite of considerable heliocentric distance, the comet exhibits a bright coma embedded into faint considerably long tail. We observed comet C/2003 WT42 with 2-m telescope of the Bulgarian National Observatory on December 4, 2005, four month before the perihelion passage. The observations were conducted again on February 25, 2007 when the comet had passed its perihelion. A contour plot of the comet is presented on Fig.1.

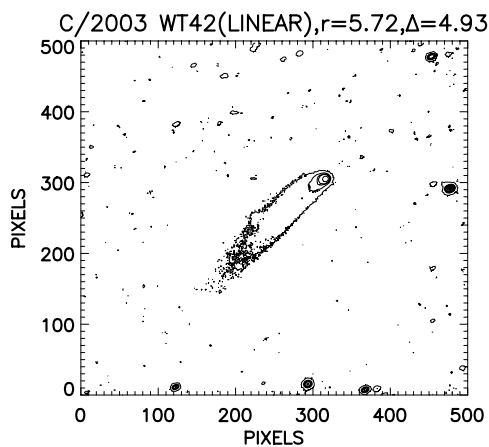


Fig.1. Image of the comet in R band. The external contour corresponds to 0.0002 mJy or 25.5 mag per 1".

Results: The Two-Channel Focal Reducer enabled to obtain pairs of images in the red and blue continuum windows free from cometary molecular emissions. Using these images brightness and color maps were constructed and the analysis of the dust environment was made. A_{fp} quantity, which is proportional to dust production rate, was derived from the red images. The A_{fp} amounted to 3000cm around the perihelion, indicating the high activity of the comet, and dropped to 950cm after the perihelion passage. A_{fp} derived in this work were compared with the data of CARA observing campaign [1] and shown on Fig.2.

Images were processed with a Roberts function to enhance possible anisotropic features. Filtered images revealed a dust jet confirming the high physical activity of the comet.

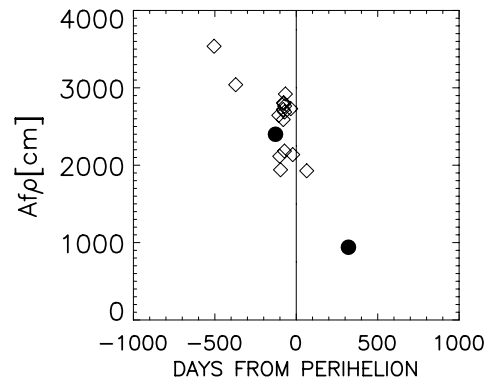


Fig.2. Evolution of A_{fp} with time. Our results (filled circles) superimposed on the data of CARA project (diamonds).

The color map shows a positive color excess, that is, the dust is redder than the color of the Sun over the entire image. The average reddening value of the near nucleus region is about 6%/1000Å, which is comparable to that derived for D-like objects. However, it is clearly seen on the map that the reddening is varying over the comet image. In an envelope around the nucleus, the reddening drops down to 3%/1000Å increasing gradually toward the tail axis.

References: [1] Cometary Archives for Amateur Astronomers, <http://cara.uai.it>