Post-perihelion narrowband imaging of comet C/2011 L4 (PanSTARRS)

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C/2011 L4 is a dynamically new comet with a relatively small perihelion distance ($q \sim 0.301$ au). Pre-perihelion observations have shown that the comet is extremely dust-rich (Bin Yang et al., 2014; C. Opitom et al., 2013). The decrease of the post-perihelion brightness of the comet was faster in comparison with the pre-perihelion increase. Combination of this circumstance with the determination of the dust-to-gas ratio in the post-perihelion phase is crucial for revealing the physical reasons for the faster decrease of the brightness after the perihelion.

We present preliminary results from narrowband imaging observations of Comet C/2011 L4 (PanSTARRS) observed in C2, C3, and continuum filters for two dates, April 30 and May 30, 2013. The data were obtained with the 2-m telescope of the Rozhen National Astronomical Observatory, equipped with the two-channel focal reducer, FoReRo2 (Jockers et al., 2000). The observing runs consist of 10 exposures with a duration of 120 s in each filter for the two dates. The heliocentric distance of the comet were increasing faster than the geocentric distance during the observations, from $r_1 = 1.27$ au to $r_2 = 1.80$ au, and $\Delta_1 = 1.52$ au to $\Delta_2 = 1.83$ au, respectively.

We calibrated the images into absolute fluxes by using the spectrophotometric standard star BD+33d2642 (Oke, 1990), observed at different zenith distances. The continuum contribution was subtracted from the images obtained with neutral gas filters, and the Haser model was applied for determination of the gas production rates of the corresponding molecules. The value of $Af\rho$ was derived and the dust-to-gas production was calculated. We discuss the obtained results for comet C/2011 L4 by comparing them with the pre-perihelion behavior of the comet and with the post-perihelion data for other comets. Finally, some arguments are presented for the relationship between the high dust-to-gas ratio of this comet and the faster decrease of its brightness after the perihelion passage.

References: Bing Yang, Jacqueline Keane, Karen Meech, et al., 2014, Astrophysical Journal, **784** L23; C. Opitom, E. Jehin, J. Manfroid, and M. Gillon, 2013, CBET **3433**; Oke, J. B. 1990, Astron. J., **99**, 5; K. Jockers, T. Credner, T. Bonev et al. 2000, Kinematika i Fizika Nebesnykh Tel, **3**, 13–18;