

MONITORING OBSERVATIONS OF THE JUPITER-FAMILY COMET 17P/HOLMES DURING ITS 2014 PERIHELION PASSAGE

*Yuna Grace Kwon¹, MASATERU ISHIGURO¹, Hidekazu Hanayama², Daisuke Kuroda³, Satoshi Honda⁴, Jun Takahashi⁴, Yoonyoung Kim¹, Myung Gyoon Lee¹, Young-Jun Choi⁵, Myung-Jin Kim⁵, Jeremie Vaubaillon⁶, Takeshi Miyaji², Kenshi Yanagisawa³, Michitoshi Yoshida⁷, Kouji Ohta⁸, Nobuyuki Kawai⁹, Hideo Fukushima¹⁰, Jun-ichi Watanabe¹⁰

1.Seoul National University, 2.Ishigakijima Astronomical Observatory, 3.Okayama Astrophysical Observatory, 4.Nishi-Harima Astronomical Observatory, 5.Korea Astronomy and Space Science Institute, 6.Observatoire de Paris, 7.Hiroshima University, 8.Kyoto University, 9.Tokyo Institute of Technology Meguro, 10.National Astronomical Observatory of Japan

Comets are the most pristine reservoir of the materials left over from the formation epoch of the solar system. When they are heated and expel this ancient material in their orbital motions around the Sun, we can have the opportunity to decipher the primitive information which have buried underneath the cometary surface for a long time. Herein, we present a brief overview of our observational results of a Jupiter-Family comet, 17P/Holmes, which underwent the historic outburst in 2007, to investigate its secular change in activity during 2014 perihelion passage. We performed the monitoring observation over two years, welcoming its first perihelion passage since the 2007 outburst. We analyzed the imaging data taken over two years, and found that there is a strong asymmetry of cometary activity with respect to the perihelion. Compared to the values taken right after the 2007 outburst, our results present a dust-production rate that has been utterly quenched by about five orders of magnitudes and is rather similar to that of pre-outburst inactive phase. We also found that the secular evolution of the fractional active area over the cometary surface had drastically dropped by about two orders of magnitudes in only one orbital revolution around the Sun. All of our results indicate that 17P/Holmes has entered upon an inactive phase far more rapidly than the prediction of the previous researches, and from this we conjecture that a surficial dust layer (~7 -10 cm in depth) of the comet play a dominant role as an insulator of sublimation of subsurface water ice from the solar irradiation.

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