

Activity and Morphology of Comet

73P/Schwassmann-Wachmann 3

close to its closest approach to the Earth

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Abstract

In May 2006, Comet 73P/Schwassmann-Wachmann 3 passed by Earth at a minimum distance of 0.067 AU which was only slightly larger than its closest encounter distance of 0.0616 AU in its original discovery apparition in 1930. Much attention was given to this close approach of Comet 73P/S-W3 because its nucleus was observed to split into 3-4 components after one outburst in its last apparition in 1995. We were not disappointed because the fragments created in 1995 were observed to break up into many sub-fragments. This process combined with the possibility of making high resolution imaging observations provided the unique opportunity of studying fresh material emitted from the deep interior of a cometary nucleus. We have carried out coordinated observations by using the Lulin One-meter Telescope (LOT) at Lulin Observatory and the 2.16-m spectrograph at Beijing Astronomical Observatory. Here we present the preliminary results on the coma activities and morphological structures of the sub-fragments.

Introduction

Periodic comet 73P/S-W 3 has broken into more than 70 different pieces as it approached the sun. All of the observed fragments in 2006 passed relatively close to the Earth (~ 0.07 AU) during the interval from May 12 through May 28. The passages of these fragments offered astronomers an excellent opportunity to examine the cometary breakup process and hopefully these observations could explain why some comets disrupted. The possible physical reasons include weak internal strength, rapid rotation or gas outburst. Here we present the preliminary results on the coma activities and morphological structures of the sub-fragments.