

THE FATE OF THE FRAGMENTS OF COMET 73P/SCHWASSMANN-WACHMANN 3 M. Küppers¹

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Introduction: Some global properties of cometary nuclei like tensile strength, density, and homogeneity are still poorly known. The results of cometary splittings provide constraints on those quantities.

The close approach to Earth of split comet 73P/Schwassmann-Wachmann 3 (SW3) in 2006 provided a unique opportunity to study the continuing split-up of fragments of a nucleus of a comet. More than 70 pieces were found (IAU circulars 8685, 8692, 8693, 8701, 8703, 8704, 8709). A few of the largest fragments are long-lived remnants of the original break-up of SW3 in 1995. Some of the smallest fragments have been observed to disappear on a timescale of days. However, the lifetime of most of the fragments, indicative of the strength of cometary nuclei on a scale of meters or (at most) tens of meters, is completely unknown.

Observations and Results: We used the Wide Field Imager on the 2.2 m telescope at the European Southern Observatory in La Silla to search for the fragments of SW3. A total of 3 hours observing time on August 16 2006 and between Sept. 17 and Sept. 26 were used to search for the fragments about 3 months after perihelion. The sensitivity of the observations permits detection of most of the fragments, assuming typical heliocentric dependence of brightness.

As expected, the major fragments were still present, although the brightness of fragment B had decreased to below magnitude 20 by mid-August, suggesting a substantial drop in activity after perihelion. The large variation in total activity suggests that the break-up of the fragments affected a substantial fraction of the active surface of fragment B.

We will report on the fraction of smaller fragments survived for several months after perihelion and the development on their brightness. Conclusions about the strengths of the cometary nucleus on various scales and about its homogeneity will be drawn.