DUST PROPERTIES OF COMET 73P/SCHWASSMANN-WACHMANN 3 FRAGMENTS B and C. David E. Harker[1], Michael L. Sitko[2], Charles E. Woodward[3], Diane H. Wooden[4], Ray W. Russell[5], David K. Lynch[5] [1]CASS, U. California, San Diego, 9500 Gilman Dr., La Jolla, CA 92093-0424. dharker@ucsd.edu. , [2]Space Science Institute. [3]Dept. of Astronomy, U. Minnesota, 116 Church St., Minneapolis, MN, 55455. [4]NASA Ames Research Center, MS 245-1, Moffett Field, CA, 94035. [5]The Aerospace Corporation, Los Angeles, CA 90009.

Introduction: In 1995, comet 73P/Schwassmann-Wachmann 3 broke apart into several (~66) fragments. Observations of two of the largest surviving fragments, [B] and [C], during the 2006 apparition provided an unique opportunity to observe potentially pristine material released from beneath the processed surface layer of a short-period, Jupiter-family comet. We present mid-infrared 11.7 and 18.5μm narrowband images and analysis of 10/20μm spectra derived from thermal grain models [1,2] obtained on Gemini-N (+Michelle) of fragments SW3-[B] and -[C].

SW3-[B]: Observations of this fragment occurred ≈27.5 days after a significant outburst event (2 April 2006 UT); the 11.7 and 18.5μm images revealed a tail of material extending > 16" from the nucleus in the anti-sunward direction at p.a.= 20.5° (Fig. 1a). The coma appears "detached" from the nucleus with a maximum in the surface brightness 3" from the peak nuclear isophote. A silicate emission feature, arising from grains < 1μm in radius, is observed in the 10μm region, both on (feature-to-continuum ratio at 10.5μm ≈1.15) and offset 3" to the southwest (feature-to-continuum ratio at 10.5μm ≈1.25) from the nuclear condensation. Weak emission arising from crystalline silicates (e.g., 11.2μm feature) was evident in the spectra of [B], and the observed SEDs can be modeled by an admixture of amorphous olivine, pyroxene, carbonaceous, and Mg-rich crystalline olivine grains (Fig 2a). By mass fraction, amorphous olivines are the dominate contributor to the SED throughout the coma; crystalline olivine mass fraction peaks ~4" from the nucleus, and the n(a)da peak is the smallest (~0.7μm) 2" from the nucleus in the anti-sunward direction. Most of the amorphous grains in the coma of [B] are moderately porous, except at 2" where they are solid. Spectra from 17-23μm are featureless in both the central and offset positions.

SW3-[C]: The coma of [C] was more condensed than that of [B], with a dust tail extension at p.a. = 225° (Fig. 1b). Spectra of fragment [C] show emission from the olivine materials as well as emission from amorphous pyroxene (Fig. 2b). In [C], the n(a)da peak is constant (~0.5μm) throughout the coma. The amorphous grains throughout the coma of [C] are of the same moderate porosity seen in most of the coma of [B].

References: [1] Harker D.E. et al. (2002) *ApJ*, 580, 579. [2] Harker D.E. et al. (2007) *Icarus,* 191, 432.

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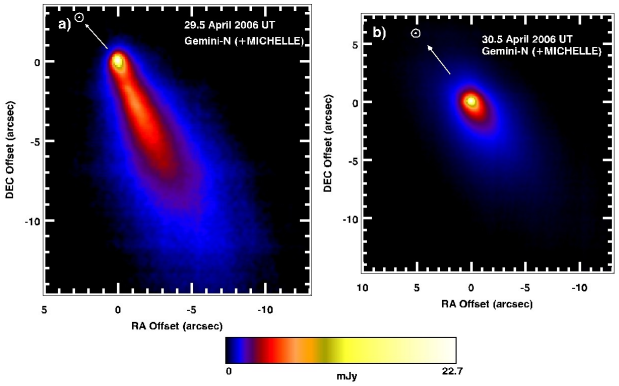

Figure 1: 73P Gemini (+Michelle) 11.7μm images *(a)* Fragment [B]; *(b)* Fragment [C]. The sunward direction is also indicated.

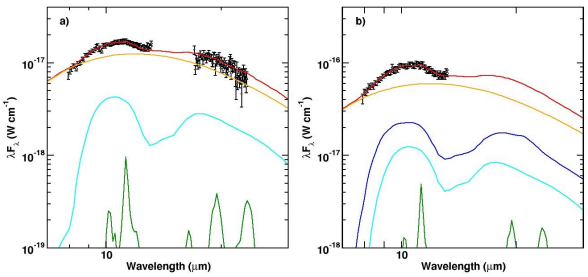

Figure 2: The 10 and 20μm spectra of: *(a)* [B]; *(b)* [C] centered on the nucleus (o*pen circles with error bars*), and the spectra model decomposition: total SED (*red*), amorphous olivine (*light blue*), amorphous pyroxene (*dark blue*), amorphous carbon (*orange*), and Mg-rich crystalline olivine (*green*).