

**Explanatory Supplement to the 9P/Tempel 1 Dust Trail Images
from the IRAS Sky Survey Atlas (ISSA)**

Data Delivered to University of Maryland

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for Archival Purposes

The Tempel 1 Debris Trail

The largest grains ejected from Tempel 1 may be expected to lie in the debris trail. Russell Walker searched the IRAS Sky Survey Atlas (ISSA) and identified and extracted 56 ISSA FITS images that contain the comet or its dust trail. All of the images were a subset of the ISSA Reject Files, images that fall within 20 degrees of the ecliptic and considered contaminated by zodiacal dust. These images were made from survey scans binned into 4 x 4 arc minute pixels. The resolution was poor and it was not obvious how much structure information could be extracted.

Therefore, during a preliminary review of these FITS images, PDS-SBN determined that these data should not be used for surface photometry of the comet or its trail and, thus, should not be included in the archive. However, PDS-SBN suggested that a record of these images be included in the archive for future reference. Therefore, PDS-SBN converted the original, unprocessed, FITS trail images to JPEG format and included the JPEGs in the archive as documentation. The following table identifies the ISSA plates and includes the B1950 right ascension and declination at the center of each image (please note that the observation dates were not available in the headers of the original FITS images):

Plate Number	HCONs	RA (deg)	Dec (deg)
147	1,2	210.0	-2.0
148	1,2	220.0	-2.0
149	1,2	231.0	-2.0
182	1,2	200.0	-1.0
183	1,2	210.0	-1.0
216	1	180.0	0.0
217	1,2	190.0	0.0
218	2	200.0	0.0

The plates cover 12.5 degrees by 12.5 degrees with 1.5 arcminute pixels (500 by 500 pixels). The corresponding JPEG image files reside in the document directory and are named InnnBnHn.JPG where I is for ISSA, nnn is the plate number, B1, B2, B3, and B4 are the four IRAS bands at 12, 25, 60, and 100 microns respectively, and H1 = HCON1, H2 = HCON2, and H3 = HCON3. The original FITS files had units of sky surface brightness in megaJanskys per steradian.

The trail is usually visible at 12 and 25um, usually at 60um and seldom at 100um. Included are all the ISSA images (bands) for a given field and HCON that the trail was visible in at least one band. The ISSA FITS images are also available on CD ROM from IPAC. For the complete sky one needs both Volume 1 and Volume 2 and possibly the CD ROM mailer issued in 1991.

Another approach to examine the trail might be using the high-resolution Zodiacal History File. This file is binned into 30-arcminute cross-scan by 1-arcminute in-scan pixels. Since the trails are almost parallel to the cross-scan direction one should be able to extract sub-arcminute data on the trail profiles.

References

Beichman, C.A., G. Neugebauer, H.J. Habing, P.E. Clegg, and T.J. Chester, 1988, Infrared Astronomical Satellite Catalog and Atlases, Volume 1, Explanatory Supplement, NASA RP-1190