

Appendix A: Data and structure of confusion noise all-sky FITS files

A.1. ISOPHOT

A.1.1. Filenames of all-sky FITS files

File names consist of the following main fields:

- each file name starts with *'skynoise_pht'*
- detector: *'C1'* – C100 camera array; *'C2'* – C200 camera array; *'P3'* – detector;
- central wavelength of the filter (μm)
- aperture: *'P'* – single pixel aperture for the C100 or C200 detectors; *'F'* – full detector array aperture for the C100 or C200 detectors; *'P3_79'* – 79" circular aperture, P3 detector; *'P3_99'* – 99" circular aperture, P3 detector; *'P3_120'* – 120" circular aperture, P3 detector; *'P3_180'* – 180" circular aperture, P3 detector; *'P3_127'* – 127"×127" rectangular aperture, P3 detector;
- measurement mode: *'R'* – rectangular chopping; *'F'* – triangular (or sawtooth) chopping; *'M'* – mini-map; *'C'* – circular reference aperture (aperture photometry);
- separation of the target and reference apertures θ (arcsec); In the case of mini-map mode the required minimal separation specific for the detector is given. There is no separator ('_') between the measurement mode (see above) and the separation in the file name.
- *'fits'* extension

A.1.2. Sample fits header:

```

SIMPLE      =                               T / Written by IDL:  Sat Jun  5 17:52:36 2004
BITPIX     =                               -32 / Number of bits per data pixel
NAXIS      =                               2 / Number of data axes
NAXIS1     =                               360 /Number of positions along axis 1
NAXIS2     =                               181 /Number of positions along axis 2
EXTEND     =                               T / FITS data may contain extensions
DATE       = '2004-06-05'                   / Creation UTC (CCCC-MM-DD) date of FITS header
BUNIT      = 'mJy'                          /
CTYPE1     = 'RA---CAR'                     /coordinate system type
CTYPE2     = 'DEC--CAR'                     /coordinate system type
CRPIX1     =                               181 /reference point of the RA grid
CRVAL1     =                               0.00000 /starting value of the RA grid
CDELT1     =                               1.00000 /increment of the RA grid per pixel (deg)
CRPIX2     =                               91 /reference point of the DEC grid
CRVAL2     =                               0.00000 /starting value of the DEC grid
CDELT2     =                               1.00000 /increment of the DEC grid per pixel (deg)
WVL        =                               100.000 /central wavelength (um)
ICCAPP     = 'TRUE'                         /inverse colour correction applied
CCTYPE     = 'nu^2*BB'                      /SED taken for colour correction
INSTR      = 'ISO-ISOPHOT'                  /
DETECTOR   = 'C1'                          /
CONFIG     = 'C'                           /measurement configuration
SEPAR      =                               184.000 /separation of the target and reference apertures
APERTURE   = 'P'                           /
C_C0       =                               6.60000 /C_0 parameter of the conversion equation
C_C1       =                               1.47000 /C_1 parameter of the conversion equation
C_ETA      =                               1.34000 /ETA parameter of the conversion equation
COMMENT FITS (Flexible Image Transport System) format is defined in 'Astronomy
COMMENT and Astrophysics', volume 376, page 359; bibcode 2001A&A...376..359H
COMMENT Standard astronomical projections are defined in:
COMMENT Calabretta, M.R. & Greisen, E.W., 2002, A&A 395, 1077
HISTORY Map created by: Cs. Kiss (pkisscs@mpia.de), ISOPHOT Data Center
HISTORY Max-Planck-Institut fuer Astronomie,
HISTORY Koenigstuhl 17, D-69117 Heidelberg, Germany
END

```

A.1.3. Unique FITS header keywords

Most FITS header keywords are standard (see Hanish et al., 2001 and Calabretta & Greisen, 2002). We discuss only the non-standard keywords below:

'WVL'	–	monochromatic wavelength (μm)
'ICCAPP'	–	inverse colour correction applied to the original ISOPHOT data
'CCTYPE'	–	spectral energy distribution used for inverse colour correction
'INSTR'	–	instrument: 'ISO/ISOPHOT'
'DETECTOR'	–	detector: 'C1', 'C2' or 'P3'
'CONFIG'	–	Measurement mode: 'R' – rectangular chopping; 'T' – triangular chopping; 'M' – mini-map; 'C' – circular aperture (aperture photometry)
'SEPAR'	–	separation (arcsec); for the mini-map mode it is always the minimum separation specific for the detector
'APERTURE'	–	aperture: 'P' – single pixel aperture for the C100 or C200 detectors; 'F' – full detector array aperture for the C100 or C200 detectors; 'P3_79' – 79'' circular aperture, P3 detector; 'P3_99' – 99'' circular aperture, P3 detector; 'P3_120' – 120'' circular aperture, P3 detector; 'P3_180' – 180'' circular aperture, P3 detector; 'P3_127' – 127'' \times 127'' rectangular aperture, P3 detector;
'C_C0'	–	C_0 parameter of the confusion noise estimate
'C_C1'	–	C_1 parameter of the confusion noise estimate
'C_ETA'	–	η parameter of the confusion noise estimate

A.2. Current/future far-infrared instruments

In this appendix we describe the data and structure of FITS files containing confusion noise predictions for instruments of ASTRO-F, Spitzer and Herschel. The data structure and astronomical projections in the FITS files were set following Hanish et al. (2001) and Calabretta & Greisen (2002).

A.2.1. Filenames

File names consist of five main fields, separated by underscores ('_'):

- each file name starts with 'skynoise'
- instrument/filter: 'astrof' – ASTRO-F/FIS, 170 μm ; 'mips' – Spitzer/MIPS 160 μm ; 'pacs110' – Herschel/PACS 110 μm ; 'pacs175' – Herschel/PACS 175 μm ;
- conversion between the COBE/DIRBE and ISOPHOT photometric systems: 'nondi' – correction is *not* applied; 'wdirbe' – correction *is* applied;
- constant or variable spectral index: 'csi' – constant spectral index ($\alpha = -3$); 'vsi' – variable spectral index;
- '.fits' extension

A.2.2. Sample fits header:

```

SIMPLE =                T / Written by IDL:  Thu Dec 11 18:21:53 2003
BITPIX =                -32 / Number of bits per data pixel
NAXIS =                  2 / Number of data axes
NAXIS1 =                 360 /Number of positions along axis 1
NAXIS2 =                 181 /Number of positions along axis 2
EXTEND =                 T / FITS data may contain extensions
DATE = '2003-12-11'     / Creation UTC (CCCC-MM-DD) date of FITS header
BUNIT = 'mJy'           /
CTYPE1 = 'RA---CAR'     /coordinate system type
CTYPE2 = 'DEC--CAR'     /coordinate system type
CRPIX1 =                 181 /reference point of the RA grid
CRVAL1 =                 0.00000 /starting value of the RA grid
CDELT1 =                 1.00000 /increment of the RA grid per pixel (deg)
CRPIX2 =                 91 /reference point of the DEC grid
CRVAL2 =                 0.00000 /starting value of the DEC grid
CDELT2 =                 1.00000 /increment of the DEC grid per pixel (deg)
WVL =                   160.000 /nominal wavelength (um)
ICCAPP = 'TRUE'         /inverse colour correction applied
CCTYPE = 'nu^2*BB'     /SED taken for colour correction
DETECTOR= 'SIRTF/MIPS' /
DIRBEPHT= 'FALSE'      /DIRBE-ISOPHOT conversion is performed
ALPHA = '-3.0'         /behaviour/value of the spectral index
CFIRBINC= 'FALSE'      /cosmic FIR background confusion noise included
COMMENT FITS (Flexible Image Transport System) format is defined in 'Astronomy
COMMENT and Astrophysics', volume 376, page 359; bibcode 2001A&A...376..359H
COMMENT Standard astronomical projections are defined in:
COMMENT Calabretta, M.R. & Greisen, E.W., 2002, A&A 395, 1077
COMMENT This file provides 1 sigma point source flux confusion noise estimates
COMMENT Reference: Kiss et al., 2004, in prep.
HISTORY Map created by: Cs. Kiss (pkisscs@mpia.de), ISOPHOT Data Center
HISTORY Max-Planck-Institut fuer Astronomie,
HISTORY Koenigstuhl 17, D-69117 Heidelberg, Germany
END

```

A.2.3. Unique FITS header keywords

Most FITS header keywords are standard (see Hanish et al., 2001 and Calabretta & Greisen, 2002). We discuss only the non-standard keywords below:

'WVL'	–	monochromatic wavelength (μm)
'ICCAPP'	–	inverse colour correction applied to the original ISOPHOT data
'CCTYPE'	–	spectral energy distribution used for inverse colour correction
'DETECTOR'	–	instrument and/or detector
'DIRBEPHT'	–	conversion between the COBE/DIRBE and ISOPHOT photometric systems applied ('TRUE', if yes, 'FALSE', if not)
'ALPHA'	–	spectral index. Set to a specific value (e.g. '-3') if constant, set to 'VARIABLE' otherwise
'CFIRBINC'	–	confusion noise due to the cosmic far-infrared background included ('TRUE', if yes, 'FALSE', if not)