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J/A+A/594/A26 Second Planck Catalogue of Compact Sources (PCCS2) (Planck+, 2016)

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Planck collaboration

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Abstract:

The Second Planck Catalogue of Compact Sources is a list of discrete objects detected in single-frequency maps from the full duration of the Planck mission and supersedes previous versions. It consists of compact sources, both Galactic and extragalactic, detected over the entire sky. Compact sources detected in the lower frequency channels are assigned to the PCCS2, while at higher frequencies they are assigned to one of two subcatalogues, the PCCS2 or PCCS2E, depending on their location on the sky. The first of these (PCCS2) covers most of the sky and allows the user to produce subsamples at higher reliabilities than the target 80% integral reliability of the catalogue. The second (PCCS2E) contains sources detected in sky regions where the diffuse emission makes it difficult to quantify the reliability of the detections. Both the PCCS2 and PCCS2E include polarization measurements, in the form of polarized flux densities, or upper limits, and orientation angles for all seven polarization-sensitive Planck channels. The improved data-processing of the full-mission maps and their reduced noise levels allow us to increase the number of objects in the catalogue, improving its completeness for the target 80% reliability as compared with the previous versions, the PCCS and the Early Release Compact Source Catalogue (ERCSC).

Description:

The Low Frequency Instrument (LFI) DPC produced the 30, 44, and 70GHz maps after the completion of eight full surveys (spanning the period 12 August 2009 to 3 August 2013). In addition, special LFI maps covering the period 1 April 2013 to 30 June 2013 were produced in order to compare the Planck flux-density scales with those of the Very Large Array and the Australia Telescope Compact Array, by performing simultaneous observations of a sample of sources over that period. The High Frequency Instrument (HFI) DPC produced the 100, 143, 217, 353, 545, and 857GHz maps after five full surveys (2009 August 12 to 2012 January 11).

File Summary:

FileName	Lrecl	Records	Explanations
ReadMe	80	.	This file
pccs030.dat	573	1560	Second Catalogue of Compact Sources, 30GHz
pccs044.dat	573	934	Second Catalogue of Compact Sources, 44GHz
pccs070.dat	573	1296	Second Catalogue of Compact Sources, 70GHz
pccs100.dat	573	1742	Second Catalogue of Compact Sources, 100GHz
pccs143.dat	573	2160	Second Catalogue of Compact Sources, 143GHz
pccs217.dat	573	2135	Second Catalogue of Compact Sources, 217GHz
pccs353.dat	573	1344	Second Catalogue of Compact Sources, 353GHz
pccs545.dat	573	1694	Second Catalogue of Compact Sources, 545GHz
pccs857.dat	573	4891	Second Catalogue of Compact Sources, 857GHz
pccs100e.dat	582	2487	Second Catalogue of Compact Sources, 100GHz, unknown reliability
pccs143e.dat	582	4139	Second Catalogue of Compact Sources, 143GHz, unknown reliability
pccs217e.dat	582	16842	Second Catalogue of Compact Sources, 217GHz, unknown reliability
pccs353e.dat	582	22665	Second Catalogue of Compact Sources, 353GHz, unknown reliability
pccs545e.dat	582	31068	Second Catalogue of Compact Sources, 545GHz, unknown reliability
pccs857e.dat	582	4891	Second Catalogue of Compact Sources, 857GHz, unknown reliability
fits/*	0	15	Original fits catalogs

See also:

VIII/88	: Planck Early Release Compact Source Catalogue (Planck, 2011)
VIII/91	: Planck Catalog of Compact Sources Release 1 (Planck, 2013)
J/A+A/536/A8	: Planck early results. VIII. ESZ sample. (Planck+, 2011)
J/A+A/581/A14	: Updated Planck catalogue PSZ1 (Planck+, 2015)
J/A+A/594/A27	: Planck Sunyaev-Zeldovich sources (PSZ2) (Planck+, 2016)
J/A+A/594/A28	: Planck Catalogue of Galactic cold clumps (PGCC) (Planck+ 2016)
J/A+A/596/A100	: Planck high-z source candidates catalog (PHZ) (Planck+, 2016)

Byte-by-byte Description of file: [pccs???.dat](#)

Bytes	Format	Units	Label	Explanations
1- 23	A23	---	Name	Source name, PCCS2 FFF GLLL.ll+BB.bbb (NAME) (G1)
25- 35	F11.7	deg	GLON	Galactic longitude based on extraction algorithm (GLON)
37- 47	F11.7	deg	GLAT	Galactic latitude based on extraction algorithm (GLAT)
49- 59	F11.7	deg	RAdeg	Right ascension (J2000) transformed from (GLON, GLAT) (RA)
61- 71	F11.7	deg	DEdeg	Declination (J2000) transformed from (GLON, GLAT) (DEC)
73- 84	E12.6	mJy	DetFlux	Flux density of source as determined by detection method (DETFLUX)
86- 97	E12.6	mJy	e_DetFlux	Uncertainty (1 sigma) in DetFlux (DETFLUX_ERR)
99-110	E12.6	mJy	AperFlux	Flux density of source as determined from the aperture photometry (APERFLUX)
112-123	E12.6	mJy	e_AperFlux	Uncertainty (1 sigma) in AperFlux (APERFLUX_ERR)
125-136	E12.6	mJy	PSFFlux	Flux density of source as determined from PSF fitting (PSFFLUX)
138-149	E12.6	mJy	e_PSFFlux	Uncertainty (1 sigma) in PSFFlux (PSFFLUX_ERR)
151-162	E12.6	mJy	GauFlux	Flux density of source as determined from 2-D Gaussian fitting (GAUFLUX)
164-175	E12.6	mJy	e_GauFlux	? Uncertainty (1 sigma) in GauFlux (GAUFLUX_ERR)
177-186	F10.6	arcmin	GauSemi1	Gaussian fit along axis 1 (FWHM) (GAU_SEMI1) (G2)
188-198	F11.6	arcmin	e_GauSemi1	? Uncertainty (1 sigma) in GauSemi1 (GAU_SEMI1ERR)
200-210	F11.6	arcmin	GauSemi2	Gaussian fit along axis 2 (FWHM) (GAU_SEMI2) (G2)
212-222	F11.6	arcmin	e_GauSemi2	? Uncertainty (1 sigma) in GauSemi2 (GAU_SEMI2ERR)
224-228	F5.1	deg	GauTheta	Gaussian fit orientation angle (GAU_THETA) (G2)
230-233	F4.1	deg	e_GauTheta	? Uncertainty (1 sigma) in GauTheta (GAU_THETAERR)
235-244	F10.6	arcmin	GauFWHMEff	Gaussian fit effective FWHM (GAU_FWHM_EFF)
246	I1	---	Extended	?=-1 Extended source flag (EXTENDED) (G5)
248	I1	---	ExtVal	?=-1 External validation flag (EXT_VAL) (G6)
250-273	A24	---	ERCSC	Name of the ERCSC counterpart, if any (ERCSC)
275-297	A23	---	PCCS1	Name of the PCCS counterpart, if any (PCCS1)
299-300	I2	---	HRel	?=-1 Highest reliability catalogue to which the source belong (HIGHEST_RELIABILITY_CAT) (G7)

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----- only for 100, 143, 217 and 353GHz -----
302-303 I2 --- CirrusN ? Number of sources (S/N>5) detected at
                        857GHz within a 1-degree radius (CIRRUS_N)
305-314 F10.6 mJy/sr SkyBri ? The mean 857GHz brightness within a
                        2° radius. This may be used as another
                        indicator of cirrus contamination
                        (SKY_BRIGHTNESS)

----- Polarization measurements (30-353GHz only) -----
316-327 F12.6 mJy P ? Polarization flux density of the sources
                        as determined by a matched filter (P) (G3).
329-339 F11.6 mJy e_P ? Uncertainty (1 sigma) in P (P_ERR)
341-350 F10.6 deg AnP ? Orientation of polarization with respect
                        to NGP (ANGLE_P) (G2) (G3).
352-361 F10.6 deg e_AnP ? Uncertainty (1 sigma) in AnP
                        (ANGLE_PERR) (G3).
363-374 F12.6 mJy ApP ? Orientation of polarization with respect
                        to NGP (APER_P) (G2) (G3).
376-387 F12.6 mJy e_ApP ? Uncertainty (1 sigma) in AperP
                        (APER_PERR) (G3).
389-400 F12.6 deg ApAnP ? Orientation of polarization with
                        respect to NGP (APER_ANGLE_P) (G2) (G3).
402-411 F10.6 deg e_ApAnP ? Uncertainty (1 sigma) in ApAnP
                        (APER_ANGLE_P_ERR) (G3).
413-423 F11.6 mJy PUL ? Polarization flux density 99.99% upper
                        limit (PUPPERLIMIT) (G9).
425-434 F10.6 mJy ApPUL ? Polarization flux density 99.99% upper
                        limit (APER_PUPPER_LIMIT) (G9)

----- Marginal polarization measurements (100-353GHz only) -----
436 I1 --- PStat ? Polarization detection status
                        (P_STAT) (G4).
438-447 F10.6 mJy PX ? Polarization flux density of the sources
                        as determined by a matched filter using
                        Bayesian polarization estimator (PX)
449-458 F10.6 mJy e_PX ? PX uncertainty; lower 95% error bar
                        (PXERRLOWER)
460-469 F10.6 mJy E_PX ? PX uncertainty; upper 95% error bar
                        (PXERRUPPER)
471-480 F10.6 deg AnPX ? Orientation of polarization with respect
                        to NGP using Bayesian polarization
                        estimator (ANGLE_PX) (G2).
482-490 F9.6 deg e_AnPX ? AnglePX uncertainty; lower 95% error bar
                        (ANGLE_PXERR_LOWER)
492-500 F9.6 deg E_AnPX ? AnglePX uncertainty; upper 95% error bar
                        (ANGLE_PXERR_UPPER)

----- Fluxes at 217, 353 and 545 GHz (857GHz only) -----
501-512 F12.6 mJy ApFlux217 ? Flux density at 217GHz of source as
                        determined from the aperture photometry
                        (APERFLUX_227)
514-523 F10.6 mJy e_ApFlux217 ? Uncertainty (1 sigma) in ApFlux217
                        (APERFLUX_ERR227)
525-536 F12.6 mJy ApFlux353 ? Flux density at 353GHz of source as
                        determined from the aperture photometry
                        (APERFLUX_353)
538-548 F11.6 mJy e_ApFlux353 ? Uncertainty (1 sigma) in ApFlux353
                        (APERFLUX_ERR353)
550-561 F12.6 mJy ApFlux545 ? Flux density at 545GHz of source as
                        determined from the aperture photometry
                        (APERFLUX_545)
563-573 F11.6 mJy e_ApFlux545 ? Uncertainty (1 sigma) in ApFlux545
                        (APERFLUX_ERR545)

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Byte-by-byte Description of file: [pccs*e.dat](#)

Bytes	Format	Units	Label	Explanations
1- 24	A24	---	Name	Source name, PCCS2E FFF GLLL.ll+BB.bbb (NAME) (G1)
26- 36	F11.7	deg	GLON	Galactic longitude based on extraction algorithm (GLON)
38- 48	F11.7	deg	GLAT	Galactic latitude based on extraction algorithm (GLAT)
50- 60	F11.7	deg	RAdeg	Right ascension (J2000) transformed from (GLON, GLAT) (RA)
62- 72	F11.7	deg	DEdeg	Declination (J2000) transformed from (GLON, GLAT) (DEC)
74- 85	E12.6	mJy	DetFlux	Flux density of source as determined by detection method (DETFLUX)
87- 98	E12.6	mJy	e_DetFlux	Uncertainty (1 sigma) in DetFlux (DETFLUX_ERR)
100-111	E12.6	mJy	AperFlux	Flux density of source as determined from the aperture photometry (APERFLUX)
113-124	E12.6	mJy	e_AperFlux	Uncertainty (1 sigma) in AperFlux (APERFLUX_ERR)
126-137	E12.6	mJy	PSFFlux	Flux density of source as determined from PSF fitting (PSFFLUX)
139-150	E12.6	mJy	e_PSFFlux	Uncertainty (1 sigma) in PSFFlux (PSFFLUX_ERR)
152-163	E12.6	mJy	GauFlux	Flux density of source as determined from 2-D Gaussian fitting (GAUFLUX)
165-176	E12.6	mJy	e_GauFlux	Uncertainty (1 sigma) in GauFlux

178-187	F10.6	arcmin	GauSem1	(GAUFLUX_ERR) Gaussian fit along axis 1 (FWHM) (GAU_SEM1) (G2)
189-200	F12.6	arcmin	e_GauSem1	? Uncertainty (1 sigma) in GauSem1 (GAUSEM1ERR)
202-212	F11.6	arcmin	GauSemi2	Gaussian fit along axis 2 (FWHM) (GAU_SEM2) (G2)
214-224	F11.6	arcmin	e_GauSemi2	? Uncertainty (1 sigma) in GauSemi2 (GAUSEM2ERR)
226-230	F5.1	deg	GauTheta	Gaussian fit orientation angle (GAU_THETA) (G2)
232-235	F4.1	deg	e_GauTheta	Uncertainty (1 sigma) in GauTheta (GAUTHETAERR)
237-246	F10.6	arcmin	GauFWHMEff	Gaussian fit effective FWHM (GAU_FWHM EFF)
----- Polarization measurements (30-353GHz only) -----				
248-259	F12.6	mJy	P	? Polarization flux density of the sources as determined by a matched filter (P) (G3)
261-271	F11.6	mJy	e_P	? Uncertainty (1 sigma) in P (P_ERR)
273-282	F10.6	deg	AnP	? Orientation of polarization with respect to NGP (ANGLE_P) (G2) (G3)
284-293	F10.6	deg	e_AnP	? Uncertainty (1 sigma) in AnP (ANGLE_PERR) (G3)
295-306	F12.6	mJy	ApP	? Orientation of polarization with respect to NGP (APER_P) (G2) (G3)
308-319	F12.6	mJy	e_ApP	? Uncertainty (1 sigma) in AperP (APER_PERR) (G3)
321-332	F12.6	deg	ApAnP	? Orientation of polarization with respect to NGP (APER_ANGLE_P) (G2) (G3)
334-343	F10.6	deg	e_ApAnP	? Uncertainty (1 sigma) in ApAnP (APER_ANGLE_P_ERR) (G3)
345-355	F11.6	mJy	PUL	? Polarization flux density 99.99% upper limit (PUPPERLIMIT) (G9)
357-366	F10.6	mJy	ApPUL	? Polarization flux density 99.99% upper limit (APER_UPPERLIMIT) (G9)
----- Marginal polarization measurements (100-353GHz only) -----				
368	I1	---	PStat	? Polarization detection status (P_STAT) (G4)
370-380	F11.6	mJy	PX	? Polarization flux density of the sources as determined by a matched filter using Bayesian polarization estimator (PX)
382-392	F11.6	mJy	e_PX	? PX uncertainty; lower 95% error bar (PX_ERR_LOWER)
394-404	F11.6	mJy	E_PX	? PX uncertainty; upper 95% error bar (PX_ERR_UPPER)
406-415	F10.6	deg	AnPX	? Orientation of polarization with respect to NGP using Bayesian polarization estimator (ANGLE_PX) (G2)
417-425	F9.6	deg	e_AnPX	? AnglePX uncertainty; lower 95% error bar (ANGLE_PX_ERR_LOWER)
427-435	F9.6	deg	E_AnPX	? AnglePX uncertainty; upper 95% error bar (ANGLE_PX_ERR_UPPER)

437	I1	---	Extended	?=-1 Extended source flag (EXTENDED) (G5)
439	I1	---	ExtVal	?=-1 External validation flag (EXT_VAL) (G6)
441-464	A24	---	ERCSC	Name of the ERCSC counterpart, if any (ERCSC)
466-488	A23	---	PCCS1	Name of the PCCS counterpart, if any (PCCS1)
490-491	I2	---	HRel	? Highest reliability catalogue to which the source belong (HIGHEST_RELIABILITYCAT) (G7)
493-495	I3	---	CirrusN	? Number of sources (S/N>5) detected at 857GHz within a 1-degree radius (CIRRUS_N)
497-506	F10.6	mJy/sr	SkyBri	? The mean 857GHz brightness within a 2° radius. This may be used as another indicator of cirrus contamination (SKY_BRIGHTNESS)
508	A1	---	Zone	[2]? Which zone ? (pccs100e.dat only) (WHICH_ZONE) (G8)
----- Fluxes at 217, 353 and 545 GHz (857GHz only) -----				
510-521	F12.6	mJy	ApFlux217	? Flux density at 217GHz of source as determined from the aperture photometry (APERFLUX_227)
523-532	F10.6	mJy	e_ApFlux217	? Uncertainty (1 sigma) in ApFlux217 (APERFLUX_ERR227)
534-545	F12.6	mJy	ApFlux353	? Flux density at 353GHz of source as determined from the aperture photometry (APERFLUX_353)
547-557	F11.6	mJy	e_ApFlux353	? Uncertainty (1 sigma) in ApFlux353 (APERFLUX_ERR353)
559-570	F12.6	mJy	ApFlux545	? Flux density at 545GHz of source as determined from the aperture photometry (APERFLUX_545)
572-582	F11.6	mJy	e_ApFlux545	? Uncertainty (1 sigma) in ApFlux545 (APERFLUX_ERR545)

Global notes:

Note (G1): Format is PCCS2 fff Glll.ll+bb.bb for sources in the PCCS2 and PCCS2E fff Glll.ll+bb.bb for sources in the PCCS2E, where fff is the frequency channel and (l, b) is the position of the source in Galactic coordinates truncated to two decimal places.

Note (G2): We follow the IAU/IEEE convention (Hamaker & Bregman 1996) for defining the angle of polarization of a source, and this convention is

