J/ApJS/216/28 SWXCS III. Cluster catalog from 2005-2012 Swift data (Liu+, 2015)

The Swift X-ray telescope Cluster Survey.
III. Cluster catalog from 2005-2012 archival data.
Liu T., Tozzi P., Tundo E., Moretti A., Rosati P., Wang J.-X.,
Tagliaferri G., Campana S., Giavalisco M.
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Redshifts ; Surveys
Keywords: catalogs; cosmology: observations; galaxies: clusters: general;
surveys; X-rays: galaxies: clusters

Abstract:
We present the Swift X-ray Cluster Survey (SWXCS) catalog obtained using archival data from the X-ray telescope (XRT) on board the Swift satellite acquired from 2005 February to 2012 November, extending the first release of the SWXCS. The catalog provides positions, soft fluxes, and, when possible, optical counterparts for a flux-limited sample of X-ray group and cluster candidates. We consider the fields with Galactic latitude |b|>20° to avoid high H I column densities. We discard all of the observations targeted at groups or clusters of galaxies, as well as particular extragalactic fields not suitable to search for faint extended sources. We finally select ~3000 useful fields covering a total solid angle of ~400deg^2. We identify extended source candidates in the soft-band (0.5-2keV) images of these fields using the software EXSdetect, which is specifically calibrated for the XRT data. Extensive simulations are used to evaluate contamination and completeness as a function of the source signal, allowing us to minimize the number of spurious detections and to robustly assess the selection function. Our catalog includes 263 candidate galaxy clusters and groups down to a flux limit of 7x10^{-15}erg/cm2/s in the soft band, and the logN-logS is in very good agreement with previous deep X-ray surveys. The final list of sources is cross-correlated with published optical, X-ray, and Sunyaev-Zeldovich catalogs of clusters. We find that 137 sources have been previously identified as clusters in the literature in independent surveys, while 126 are new detections. Currently, we have collected redshift information for 158 sources (60% of the entire sample).

Description:
From the entire Swift XRT archive in the period 2005 February-2012 November, we select all the fields that can be used to build an unbiased, serendipitous X-ray cluster catalog.

File Summary:

FileName	Lrecl	Records	Explanations
ReadMe	80	.	This file
table2.dat	91	263	Swift X-ray Cluster Survey (SWXCS) catalog
table3.dat	139	383	Catalog cross-correlation results for 163 clusters

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See also:
VIII/88 : Planck Early Release Compact Source Catalogue (Planck, 2011)
VIII/76 : Leiden/Argentine/Bonn (LAB) Survey of Galactic HI (Kalberla+ 2005)
IX/10 : ROSAT All-Sky Bright Source Catalogue (1RXS) (Voges+ 1999)
VII/175 : Edinburgh-Durham Southern Galaxy Cat. - Cluster Cat. (Lumsden+ 1992)
VII/110 : Rich Clusters of Galaxies (Abell+ 1989)
II/213 : Hickson's Compact groups of Galaxies (Hickson+ 1982-1994)
J/ApJS/216/27 : Galaxy clusters in the SPT-SZ survey (Bleem+, 2015)
J/A+A/567/A89 : Swift X-ray Telescope Cluster Survey. II. (Tozzi+, 2014)
J/ApJ/771/137 : WMAP observations of Planck ESZ clusters (Ma+, 2013)
J/A+A/555/A30 : REFLEX II. Properties of the survey (Boehringer+ 2013)
J/A+A/547/A57 : Swift X-ray Telescope Cluster Survey (Tundo+, 2012)
J/MNRAS/423/1024 : XCS-DR1 Cluster Catalogue (Mehrtens+, 2012)
J/ApJS/199/34 : Clusters of galaxies in SDSS-III (Wen+, 2012)
J/A+A/534/A109 : MCXC Meta-Catalog X-ray galaxy Clusters (Piffaretti+, 2011)
J/ApJS/195/10 : The CDF-S survey: 4Ms source catalogs (Xue+, 2011)
J/ApJ/736/21 : Galaxy clusters opt. cat. from AMF on SDSS DR6 (Szabo+ 2011)
J/ApJS/191/254 : GMBCG galaxy cluster catalog from SDSS DR7 (Hao+, 2010)
J/AJ/137/2981 : Northern Optical Cluster Survey. III. (Gal+, 2009)
J/ApJS/174/117 : Properties and metal abundances of clusters (Maughan+, 2008)
J/ApJS/173/185 : GALEX UV atlas of nearby galaxies (Gil de Paz+, 2007)
J/ApJS/172/561 : The 400d cluster Survey (Burenin+, 2007)
J/MNRAS/379/867 : BCG C4 cluster catalog (Von Der Linden+, 2007)
J/ApJ/660/239 : MaxBCG cat. of galaxy clusters from SDSS (Koester+, 2007)
J/ApJS/167/1 : Galaxy groups and clusters from SDSS (Berlind+, 2006)
J/ApJ/645/955 : ChaMP serendipitous galaxy cluster survey (Barkhouse+, 2006)
J/AJ/130/968 : SDSS-C4 cluster catalog (Miller+, 2005)
J/A+A/425/367 : REFLEX Galaxy Cluster Survey catalogue (Boehringer+, 2004)
J/ApJ/607/L33 : First IBIS Catalog: 20-100keV (Bird+, 2004)

J/AJ/125/2064 : Northern Optical Cluster Survey. II. (Gal+, 2003)
J/ApJS/129/435 : NORAS galaxy cluster survey. I. (Bohringer+, 2000)
http://swxcs.ustc.edu.cn/ : SWXCS home page

Byte-by-byte Description of file: table2.dat

Bytes	Format	Units	Label	Explanations
1- 5	A5	---	---	[SWXCS]
7- 20	A14	---	SWXCS	IAU registry identifier (1)
21	A1	---	f_SWXCS	[*] Source in first release (G1)
23- 32	F10.6	deg	RAdeg	Right Ascension in decimal degrees (J2000)
34- 43	F10.6	deg	DEdeg	Declination in decimal degrees (J2000)
45- 51	I7	s	Exp	Effective exposure time
53- 57	F5.2	10+20/cm2	NH	[0.5/12] Galactic H I column density
59- 63	F5.1	arcsec	Reff	[27/485] Effective radius (2)
65- 69	I5	ct	Nnet	[80/40091] Net 0.5-2keV band source counts
71- 73	I3	ct	e_Nnet	The 1σ uncertainty in Nnet
75- 79	F5.1	---	SNR	[5/157] Signal-to-Noise in 0.5-2 keV band
81- 86	F6.1	10-17W/m2	Flux	[0.6/1064] The 0.5-2keV band flux; in 10^{-14}erg/cm^2/s unit
88- 91	F4.1	10-17W/m2	e_Flux	The 1σ uncertainty in Flux

Note (1): Sources included in the first release keep the name used in Paper II (J/A+A/567/A89) despite the new centroid positions.
Note (2): The area of the source region is πR_{eff}^2.

Byte-by-byte Description of file: table3.dat

Bytes	Format	Units	Label	Explanations
1- 5	A5	---	---	[SWXCS]
7- 20	A14	---	SWXCS	IAU registry identifier
21	A1	---	f_SWXCS	[*] Source in first release (G1)
23- 31	F9.7	---	zopt	[0.01/1]? Optical redshift of cluster or galaxy counterpart
33	A1	---	f_zopt	[p] p = photometric redshift
35- 38	F4.2	---	zTNG	[0.2/0.9]? Telescopio Nazionale Galileo (TNG) measured redshift from Paper II (J/A+A/567/A89)
40- 43	F4.2	---	e_zTNG	[0/0.1]? Lower uncertainty limit in zTNG
45- 48	F4.2	---	E_zTNG	[0/0.1]? Upper uncertainty limit in zTNG
50- 54	F5.3	---	zX	[0.06/1]? X-ray redshift from Paper II (J/A+A/567/A89)
56- 60	F5.3	---	e_zX	[0/0.1]? Lower uncertainty limit in zX
62- 66	F5.3	---	E_zX	[0/0.1]? Upper uncertainty limit in zX
68- 76	A9	---	r_Cl	Catalog where cluster counter is from (1)
78-103	A26	---	Cl	Cluster counterpart identifier
105-134	A30	---	Gal	Galaxy counterpart identifier within 7" found in NED
136-139	F4.2	arcmin	Sep	[0.01/4.7]?=0 Match separation

Note (1): Catalogs are:
WHL = SDSS WHL catalog (Wen et al. 2012, J/ApJS/199/34; <[WHL2012] JHHMMSS.s+DDMMSS> in Simbad)
AMF = SDSS AMF catalog (Szabo et al. 2011, J/ApJ/736/21; <[SPD2011] NNNNN> in Simbad)
MaxBCG = SDSS MaxBCG catalog (Koester et al. 2007, J/ApJ/660/239; <[KMA2007] DDD.ddddd+DD.ddddd> in Simbad)
GMBCG = SDSS GMBCG catalog (Hao et al. 2010, J/ApJS/191/254; <GMBCG DDD.ddddd+DD.ddddd> in Simbad)
SDSSC4 = SDSSC4 catalog (Miller et al. 2005, J/AJ/130/968, <SDSS-C4 NNNN> in Simbad; von der Linden et al. 2007, J/MNRAS/379/867, <SDSS-C4-DR3 NNNN> in Simbad)
Abell = Abell catalog (Abell et al. 1989, VII/110; <ACO NNNN> in Simbad)
NSCS1 = NSCS1 catalog (Gal et al. 2003, J/AJ/125/2064; <NSC JHHMMSS+DDMMSS> in Simbad)
NSCS2 = NSCS2 catalog (Gal et al. 2003, J/AJ/125/2064; <NSC JHHMMSS+DDMMSS> in Simbad)
EDCC = EDC catalog (Lumsden et al. 1992, VII/175; <EDCC NNN> in Simbad)
Berlind06 = SDSS galaxy groups and clusters catalog built by Berlind et al. (2006, J/ApJS/167/1; <[BFW2006] MrNN NNNNN> in Simbad)
400d = ROSAT 400d catalog (Burenin et al. 2007, J/ApJS/172/561; <[BVH2007] NNN> in Simbad)
NORAS = Northern ROSAT All-Sky catalog (Bohringer et al. 2000, J/ApJS/129/435; <RXC JHHMM.m+DDMM> in Simbad)
REFLEX = ROSAT-ESO flux Limited X-ray galaxy cluster catalog (Bohringer et al. 2004, J/A+A/425/367)
XCS = XMM-Newton Cluster Survey catalog (Mehrtens et al. 2012, J/MNRAS/423/1024; <XMMXCS JHHMMSS.s+DDMMSS.s> in Simbad)
ChaMP = Chandra Multiwavelength Project galaxy cluster catalog (Barkhouse et al. 2006, J/ApJ/645/955; <[BGV2006] NNN> in Simbad)
MCXC = MCXC catalog (Piffaretti et al. 2011, J/A+A/534/A109;

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              <MCXC JHHMM.m+DDMM> in Simbad)
  Planck    = Planck Collaboration et al. 2014A&A...571A..29P
  SPT       = South Pole Telescope (SPT; Bleem et al. 2015, J/ApJS/216/27;
              <SPT-CL JHHMM+DDMM> in Simbad)
  NED       = NASA/IPAC Extragalactic Database (http://ned.ipac.caltech.edu/)
            = 16 cluster counterparts detected via the SZ effect
          See section 5.
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Global notes:

Note (G1):
    * = source included in the first release of SWXCS (Paper I, J/A+A/547/57;
        Paper II, J/A+A/567/A89).

History:
    From electronic version of the journal

References:

Tundo et al.	Paper I.	2012A&A...547A..57T	Cat. J/A+A/547/57
Tozzi et al.	Paper II.	2014A&A...567A..89T	Cat. J/A+A/567/A89

(End) Greg Schwarz [AAS], Emmanuelle Perret [CDS] 05-Mar-2015

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