

SPICA's Merise Analysis

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Abstract

Merise analysis.

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1 Data Dictionnaires

- 1.1 Data Dictionary of Image entity
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- 1.3 Data Dictionary of Scamp plugin entity
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- 1.5 Data Dictionary of Astrophoto calibration entity
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2 The Conceptual Model Of Data

3 The CODASYL Logical Model

4 The Relationnal Logical Model Of Data

Here is the relationnal logical model of data used to design the database:

- 1. ASTROPHOTO CALIBRATION (ASTROPHOTO ID, ASTREFCAT, XML PATH, FLAT FIELD, OUTPUT ZP)
- 2. ASTROPHOTO CALIBRATION-IMAGE RELATION (CALIBRATION ID, ASTROPHOTO ID, IMAGE ID)
- 3. CALIBRATION KIT (CALIBRATION KIT ID, NAME, BAD PIX MASK, FLAT FIELD)
- 4. CART ITEM (ITEM ID, DJANGO'S USER ID, PROCESSING KIND ID, NAME, DATA, DATE)
- 5. CHANNEL (CHANNEL ID, INSTRUMENT ID, NAME, WAVE LENGTH, URL, WAVE CURVE, TRANS CURVE, MAG OFFSETS)
- 6. COADDITION (COADDITION ID, ...)
- 7. CONFIG FILE (CONFIG ID, DJANGO'S USER ID, PROCESSING KIND ID, NAME, CONTENT, DATA, DATE)
- 8. FINAL QUALITY COMMENT (FINAL COMMENT ID, COMMENT)
- 9. FINAL QUALITY EVALUATION (DJANGO'S USER ID, FITSOUT ID, FINAL COMMENT ID, DATE, GRADE, CUSTOM COMMENT)
- 10. FIRST QUALITY COMMENT (FIRST COMMENT ID, COMMENT)
- 11. FIRST QUALITY EVALUATION (DJANGO'S USER ID, FITSIN ID, FIRST COMMENT ID, DATE, GRADE, CUSTOM COMMENT)
- 12. FITS TABLES (TABLE ID, NAME, INSTRUMENT, CHANNEL, RUN, QSO STATUS, OBJECT, FITS TABLE, ABSORPTION, ABSORPTION ERR, IS PHOT)
- 13. FITSIN PLUGIN (FITSIN ID, PROCESSING TASK ID, RA OFFSET, DEC OFFSET, RA STD DEV, DEC STD DEV, MINIMUM PSF FWHM, AVERAGE PSF FWHM, MAXIMUM PSF FWHM, MINIMUM PSF HALF-LIGHT DIAMETER, AVERAGE PSF HALF-LIGHT DIAMETER, MAXIMUM PSF HALF-LIGHT DIAMETER, MINIMUM PSF ELONGATION, AVERAGE PSF ELONGATION, MAXIMUM PSF ELONGATION, MINIMUM PSF CHI2/D.O.F., AVERAGE PSF CHI2/D.O.F., MAXIMUM PSF

- CHI2/D.O.F., MINIMUM PSF RESIDUALS, AVERAGE PSF RESIDUALS, MAXIMUM PSF RESIDUALS, MINIMUM PSF ASYMMETRY, AVERAGE PSF ASYMMETRY, MAXIMUM PSF ASYMMETRY, MINIMUM NUMBER OF PSF STARS, AVERAGE NUMBER OF PSF STARS, MAXIMUM NUMBER OF PSF STARS, MEDIAN BACKGROUND, BACKGROUND RMS, SATURATION LEVEL, FLAT PATH, MASK PATH, REGION PATH, QUALITYFITS CONFIG, RESULTS INGESTION LOG, HTTP URL, PREVIOUS RELEASE GRADE, PREVIOUS RELEASE COMMENT)
14. FITSOUT PLUGIN (FITSOUT ID, PROCESSING TASK ID)
 15. IMAGE (IMAGE ID, CALIBRATION KIT ID, INGESTION ID, CHANNEL ID, INSTRUMENT ID, NAME, SKY FOOTPRINT, PATH, ALPHA, DELTA, EQUINOX, OBJECT, DATE OBS, EXP TIME, PHOTC HEADER, PHOTC CUSTOM, PHOTK, AIRMASS, ABSORPTION, CHECKSUM, GAIN, INGESTION DATE, FLAT, MASK, REG, QSO STATUS)
 16. IMAGE-TASK RELATION (I-T ID, IMAGE ID, PROCESSING TASK ID)
 17. IMAGE SELECTIONS (SELECTION ID, DJANGO'S USER ID, NAME, DATA, DATE)
 18. INGESTION (INGESTION ID, DJANGO'S USER ID, LABEL, START INGESTION DATE, END INGESTION DATE, EMAIL, PATH, CHECK FITSVERIFY, CHECK QSO STATUS, CHECK MULTIPLE INGESTION, EXIT CODE, REPORT)
 19. INSTRUMENT (INSTRUMENT ID, NAME, TELESCOPE, URL, TIMEZONE, ALTITUDE, NCHIPS, AS-TRINSTRU_KEY, PHOTINSTRU_KEY, PATH)
 20. MISC DATA (MISC ID, DJANGO'S USER ID, KEY, DATA, DATE)
 21. PROCESSING KIND (PROCESSING KIND ID, INTERNAL NAME, LABEL)
 22. PROCESSING TASK (PROCESSING TASK ID, DJANGO'S USER ID, PROCESSING KIND ID, START DATE, END DATE, SUCCESS, ERROR LOG, HOSTNAME, RESULTS OUTPUT DIRECTORY)
 23. RUN (RUN ID, INSTRUMENT ID, NAME, PI, URL, EMAIL, PROCESS REQUEST DATE, DATE START, DATE END, DATE DOWNLOAD, RELEASE DATE)
 24. RUN-IMAGE RELATION (R-I ID, IMAGE ID, RUN ID)
 25. SCAMP PLUGIN (SCAMP ID, PROCESSING TASK ID, CONFIG, RESULTS INGESTION LOG, HTTP URL)
 26. SURVEY (SURVEY ID, NAME, COMMENT, URL)
 27. SURVEY-INSTRUMENT RELATION (S-I ID, SURVEY ID, INSTRUMENT ID)

Full name	DB field name	Description	Unit	Type	Display Format
Sky footprint	skyfootprint	Footprint of image on sky	deg	Multi-polygon	%8f
Image name	name	Image name (without the .fits extension)	-	string	%s
Image path	path	Path of image file (cluster or local)	-	string	%s
Right ascension	alpha	Right ascension of field centre	deg	double	%02d:%02d:%05.2f
Declination	delta	Declination of field centre	deg	double	%+02d:%02d:%04.1f
Equinox	equinox	Equinox at time of observation	yr	double	%7.2f
Object name	object	Object identifiant	-	string	%s
Observation date	dateobs	Date and time at start of observation	-	datetime	<i>date %c format</i>
Exposure time	exptime	Effective exposure time	s	double	%9.2f
Magnitude zero-point	photc	Magnitude Zero-point for 1s exposure	mag	float	%+8.4f
Extinction coefficient	photk	Extinction coefficient at airmass 1	mag	float	%7.4f
Airmass	airmass	Airmass at start of observation	-	float	%8.4f
Absorption	absorption	Absorption at start of observation	mag	float	%+7.4f
Checksum	checksum	Image file checksum	-	unsigned long long	%0x
Gain	gain	Detector conversion factor	e-/ADU	vector of floats	%8.2f
Ingestion date	ingestion_date	Date and time at start of ingestion	-	datetime	<i>date %c format</i>
Flatfield	flat	Flatfield filename	-	string	%s
Mask	mask	Mask filename	-	string	%s
Ds9 region file	reg	Ds9 region filename	-	string	%s
Validation flag	QS0status	Image validation status	-	unsigned char	%c

Table 1: Data dictionary of Image entity

Full name	DB field name	Description	Unit	Type	Display Format
RA offset	astoffra	Offset wrt astrometric reference catalogue in RA	arcsec (")	float	%8.3g
Dec offset	astoffde	Offset wrt astrometric reference catalogue in Dec	arcsec (")	float	%8.3g
	astromaccuracy				
RA std dev	aststddevra	Dispersion wrt astrometric reference catalogue in RA	arcsec(")	float	%8.3g
Dec std dev	aststddevde	Dispersion wrt astrometric reference catalogue in Dec	arcsec(")	float	%8.3g
Minimum PSF FWHM	psffwhmin	Minimum Full-Width at Half-Maximum of the PSF	arcsec(")	float	%8.3g
Average PSF FWHM	psffwhm	Central/average Full-Width at Half-Maximum of the PSF	arcsec(")	float	%8.3g
Maximum PSF FWHM	psffwhmax	Maximum Full-Width at Half-Maximum of the PSF	arcsec(")	float	%8.3g
Minimum PSF half-light diameter	psfhldmin	Minimum half-light diameter of the PSF	arcsec(")	float	%8.3g
Average PSF half-light diameter	psfhldm	Average half-light diameter of the PSF	arcsec(")	float	%8.3g
Maximum PSF half-light diameter	psfhldmax	Maximum half-light diameter of the PSF	arcsec(")	float	%8.3g
Minimum PSF elongation	psfelmin	Minimum elongation of the PSF	-	float	%5.2f
Average PSF elongation	psfel	Central/average elongation of the PSF	-	float	%5.2f
Maximum PSF elongation	psfelmax	Maximum elongation of the PSF	-	float	%5.2f
Minimum PSF chi2/d.o.f.	psfchi2min	Minimum chi2/d.o.f. of the PSF fit	-	float	%7.2g
Average PSF chi2/d.o.f.	psfchi2	Central/average chi2/d.o.f. of the PSF fit	-	float	%7.2g
Maximum PSF chi2/d.o.f.	psfchi2max	Maximum chi2/d.o.f. of the PSF fit	-	float	%7.2g
Minimum PSF residuals	psfresimin	Minimum residuals from the PSF fit	-	float	%7.2g
Average PSF residuals	psfresi	Central/average residuals from the PSF fit	-	float	%7.2g
Maximum PSF residuals	psfresimax	Maximum residuals from the PSF fit	-	float	%7.2g
Minimum PSF asymmetry	psfasymmin	Minimum asymmetry from the PSF fit	-	float	%7.2g
Average PSF asymmetry	psfasym	Central/average asymmetry from the PSF fit	-	float	%7.2g
Maximum PSF asymmetry	psfasymmax	Maximum asymmetry from the PSF fit	-	float	%7.2g
Minimum number of PSF stars	nstarsmin	Minimum number of point-sources per detector used for PSF modeling	-	long int	%d
Average number of PSF stars	nstars	Average number of point-sources per detector used for PSF modeling	-	long int	%d
Maximum number of PSF stars	nstarsmax	Maximum number of point-sources per detector used for PSF modeling	-	long int	%d
Median background	bkg	Median background level	ADU	float	%9.4g
Background RMS	bkgstdev	Dispersion RMS of the background level	ADU	float	%8.3g
Saturation level	satlev	Detector saturation level	ADU	float	%9.4g
Path to mask	mask	Absolute path to mask data	-	string	%s
Path to flat	flat	Absolute path to flat data	-	string	%s
Path to region	reg	Absolute path to region data	-	string	%s
QualityFITS configuration	qfconfig	QF configuration file serialized content (base64 encoding over zlib compression)	-	string	%s
HTTP url	www	URL to QF output HTML data	-	string	%s
Results ingestion log	qflog	Results ingestion log	-	string	%s
Previous quality evaluation	prevrelgrade	Previous QualityFITS-in grading	-	string	%s
Previous quality comment	prevrelcomment	Previous QualityFITS-in comment	-	string	%s

Table 2: Data dictionary of FITSIn plugin entity

Full name	DB field name	Description	Unit	Type	Display Format
Results ingestion log	log	Results ingestion log	-	string	%s
Scamp configuration	config	Scamp configuration file serialized content (base64 encoding over zlib compression)	-	string	%s
HTTP url	www	URL to Scamp output data	-	string	%s

Table 3: Data dictionary of `Scamp plugin` entity

DB field name	XML file	Attribute's value
astoffra	scamp.xml	AstromOffset_Reference
astoffde	scamp.xml	AstromOffset_Reference
astromaccuracy	-	-
aststdevra	scamp.xml	AstromSigma_Reference
aststdevde	scamp.xml	AstromSigma_Reference
psffwhmin	psfex.xml	FWHM_Min
psffwhm	psfex.xml	FWHM_Mean
psffwhmax	psfex.xml	FWHM_Max
psfhldmin	psfex.xml	-
psfhldm	psfex.xml	-
psfhldmax	psfex.xml	-
psfelmin	psfex.xml	Elongation_Min
psfel	psfex.xml	Elongation_Mean
psfelmax	psfex.xml	Elongation_Max
psfchi2min	psfex.xml	Chi2_Min
psfchi2	psfex.xml	Chi2_Mean
psfchi2max	psfex.xml	Chi2_Max
psfresimin	psfex.xml	Residuals_Min
psfresi	psfex.xml	Residuals_Mean
psfresimax	psfex.xml	Residuals_Max
psfasymmin	psfex.xml	Asymmetry_Min
psfasym	psfex.xml	Asymmetry_Mean
psfasymmax	psfex.xml	Asymmetry_Max
nstarsmin	psfex.xml	NStars_Accepted_Min
nstars	psfex.xml	NStars_Accepted_Mean
nstarsmax	psfex.xml	NStars_Accepted_Max
bkg	accept.xml	Mbkg
bkgstdev	-	-
satlev	swarp.xml	SatLev_Default

Table 4: Table Field - XML Data Mapping

Full name	DB field name	Description	Type	Precision
	astrefcat xmlpath flatfield outputzp			

Table 5: Data dictionary of **Astrophoto** calibration entity

Full name	DB field name	Description	Type	Precision
	name badpixelmask flatfield			

Table 6: Data dictionary of **Calibration kit** entity

Full name	DB field name	Description	Type	Precision
	name wavelength url wavecurve transcurve magoffsets			

Table 7: Data dictionary of **Channel** entity

Full name	DB field name	Description	Type	Precision
	name telescope url timezone altitude nchips astrinstru_key photinstru_key path			

Table 8: Data dictionary of **Instrument** entity

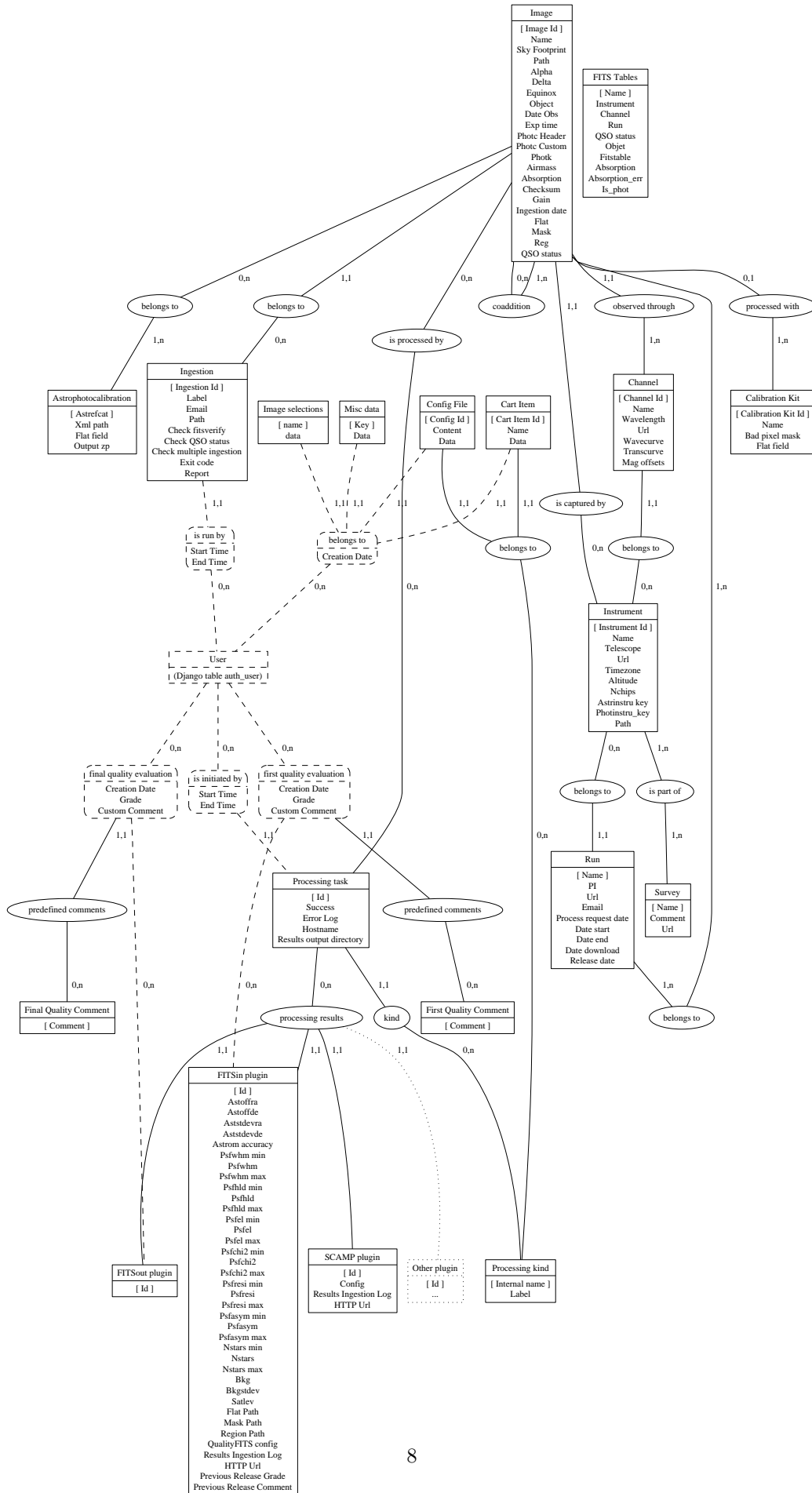


Figure 1: The conceptual model of data (MCD). Properties surrounded with brackets are entities identifiers. The *User* entity (and its relations) is displayed with a dashed style because it is part of the standard Django's database model.

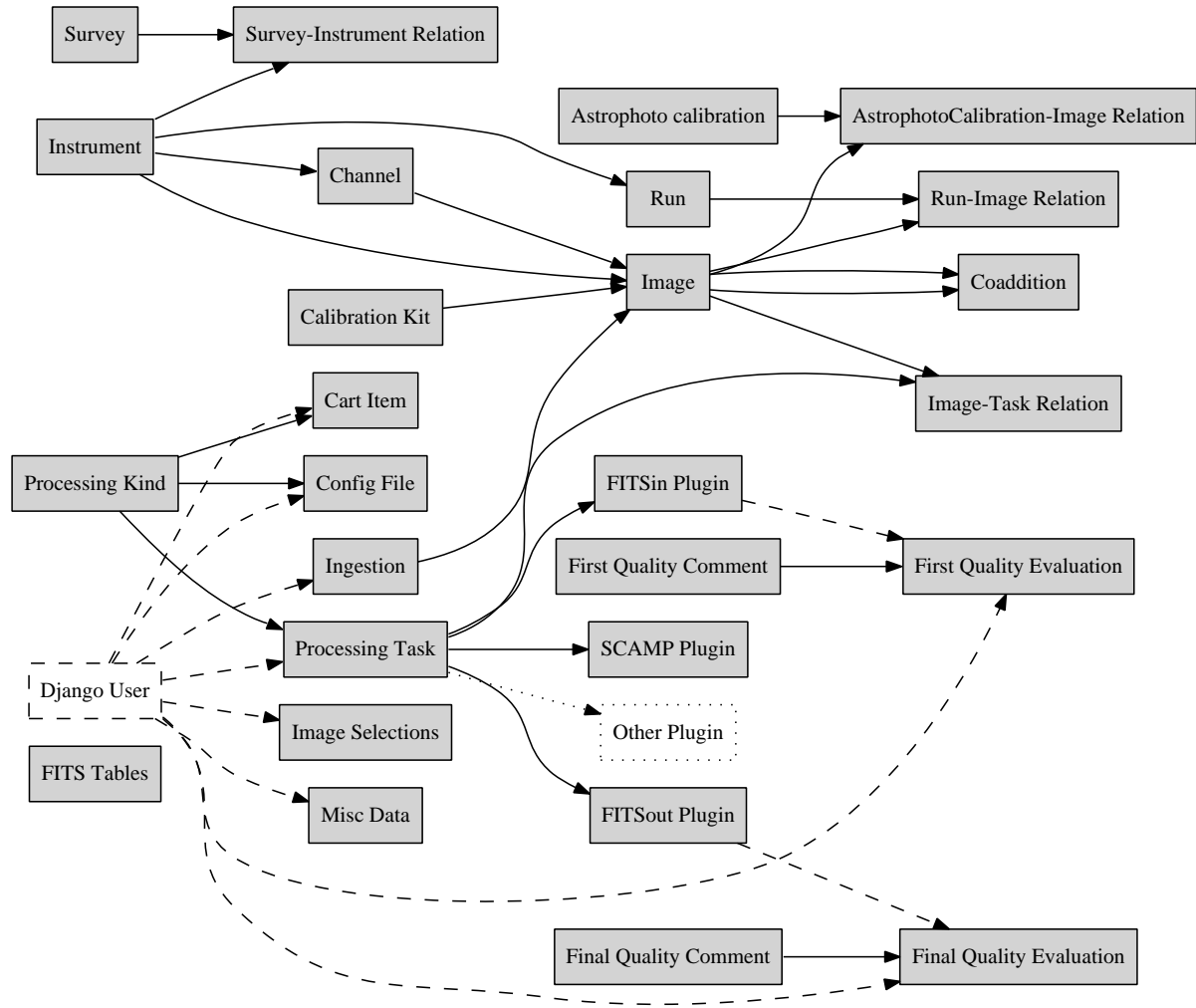


Figure 2: The CODASYL logical model resulting of transformation rules applied to the previous MCD model. The *Django User* record is displayed with a dashed style because it is part of the standard Django's database model.

CODASYL Record name	DB table name	Django's class(model) name
Astrophoto Calibration	spica2_astrophotocalibration	Astrophotocalibration
AstrophotoCalibration-Image Relation	spica2_rel_ai	Rel_ai
Calibration Kit	spica2_calibrationkit	CalibrationKit
Cart Item	spica2_cartitem	CartItem
Channel	spica2_channel	Channel
Coaddition	spica2_coaddition	Coaddition
Config File	spica2_configfile	ConfigFile
Final Quality Comment	spica2_finalqcomment	FinalQComment
Final Quality Evaluation	spica2_finalqeval	FinalQEval
First Quality Comment	spica2_firstqcomment	FirstQComment
First Quality Evaluation	spica2_firstqeval	FirstQEval
FITS Tables	spica2_fitstable	Fitstable
FITSIn Plugin	spica2_plugin_fitsin	Plugin_fitsin
FITSOut Plugin	spica2_plugin_fitsout	Plugin_fitsout
Image	spica2_image	Image
Image-Task Relation	spica2_rel_it	Rel_it
Image Selections	spica2_imageselections	ImageSelections
Ingestion	spica2_ingestion	Ingestion
Instrument	spica2_instrument	Instrument
Misc Data	spica2_miscdata	MiscData
Processing Kind	spica2_processing_kind	Processing_kind
Processing Task	spica2_processing_task	Processing_task
Run	spica2_run	Run
Run-Image Relation	spica2_rel_ri	Rel_ri
SCAMP Plugin	spica2_plugin_scamp	Plugin_scamp
Survey	spica2_survey	Survey
Survey-Instrument Relation	spica2_rel_si	Rel_si

Table 9: Record-Table name mappings