

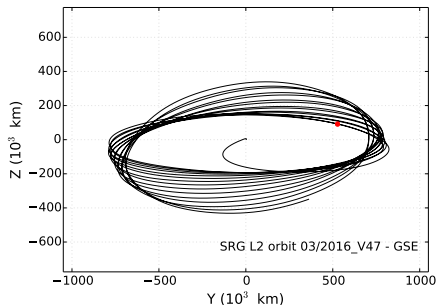
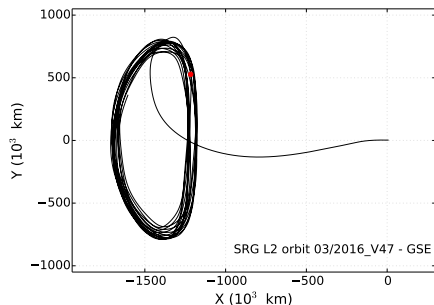
eROSITA/SRG - Mission planning

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Hamburger Sternwarte

eROSITA Consortium Meeting, Garching, 23-26 April 2018





Technical basics and angular constraints (SC_Z)

- Sun: $\Delta Sun_{max} \pm 20$ deg; 13 deg in survey (vs. XOZ plane)
- Earth: $\Delta Earth_{max} \pm 24$ deg
- SRG launch: March/April 2019 with Proton-M/Blok-DM – **TBC**
- SRG orbit: launch date, ground stations, burns...
...likely similar to March 2016 launch – **TBC**



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eROSITA MPL

This page provides general mission planning information and tools to support eROSITA/SRG observation planning.

The current focus is on the CalPV phase, the first scientific phase of eROSITA. The SRG launch is planned for September/October 2018 (alternative window in March/April). The CalPV phase starts roughly 65 days after launch and has a duration of about 50 days (30 days Cal + 20 days PV, mixed observations).

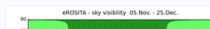
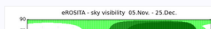
The CalPV time frame may change by up to 10 days independent of the launch date. Make sure your targets

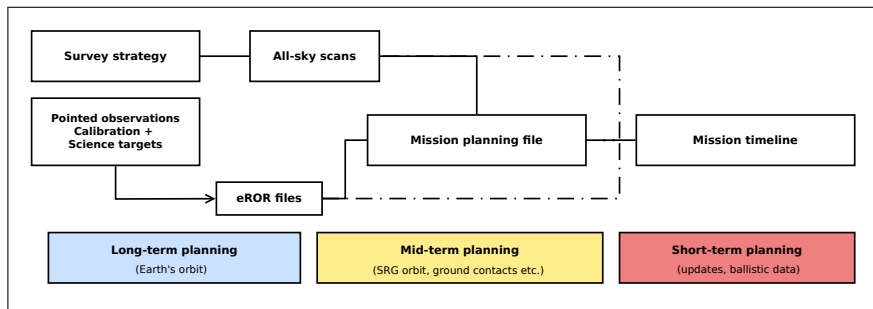
Mission planning website at Hamburger Sternwarte

- <https://www.hs.uni-hamburg.de/hserosita>
- linked in: [erosita.mpe.mpg.de](https://www.linkedin.com/company/erosita.mpe.mpg.de)
- MPL information and user support, regularly updated

Scenario

SRG launch window: early September - mid October 2018

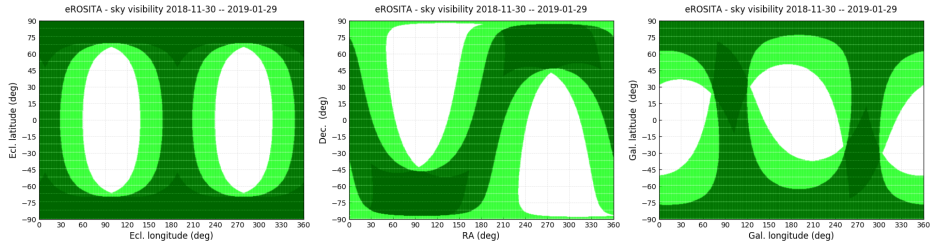




Mission planning strategy, files and parameters

- DE/RU videocons - **ongoing, 'normal work'**
- SRG Science Ground Segment -
IKI/MPE Interface Control Document
- eRO-HS-MPL documents (eROSITA Wiki)

eROSITA MPL - CalPV & early science



Basic sky visibility in anticipated CalPV phase (colors: min. fraction 0.0, 0.5, 1.0)

Mock CalPV - adopted scenario

- launch date + 65 ± 10 days
- start: 01 December 2018 (similar: 01 June 2019)
- duration: ~ 50 days, 30 d Cal + 20 d PV, interleaved observations



Mission planning and mock timeline creation for CalPV

Achievements:

- Cal + PV program scheduled, 100 % complete
- 52 days used (inc. 5 d survey test and 'First Light')
- realistic calibration program and real PV targets
- no splits etc., always within sun+earth constraints

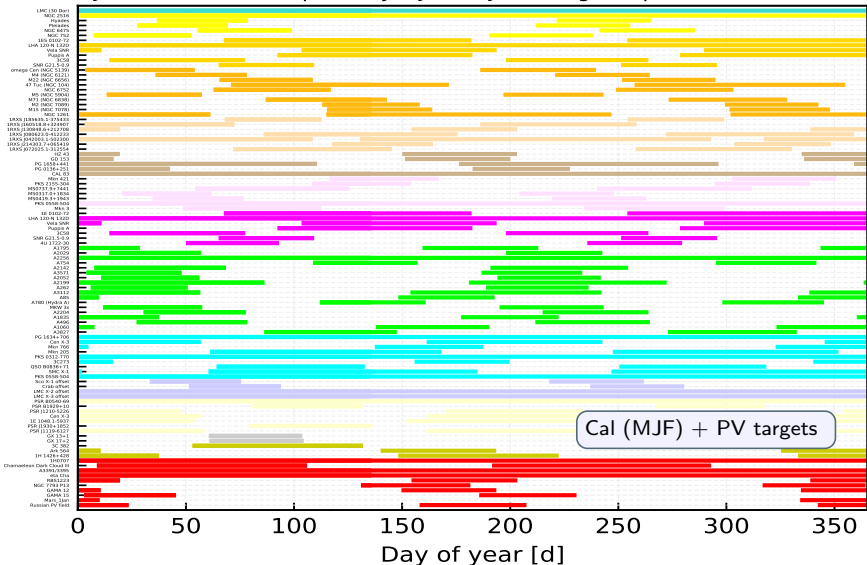
Caveats:

- includes a few 'dummy' observations
- no time loss included, old SC trajectory
- visibility depends on launch date - roughly 0.5 yr periodicity

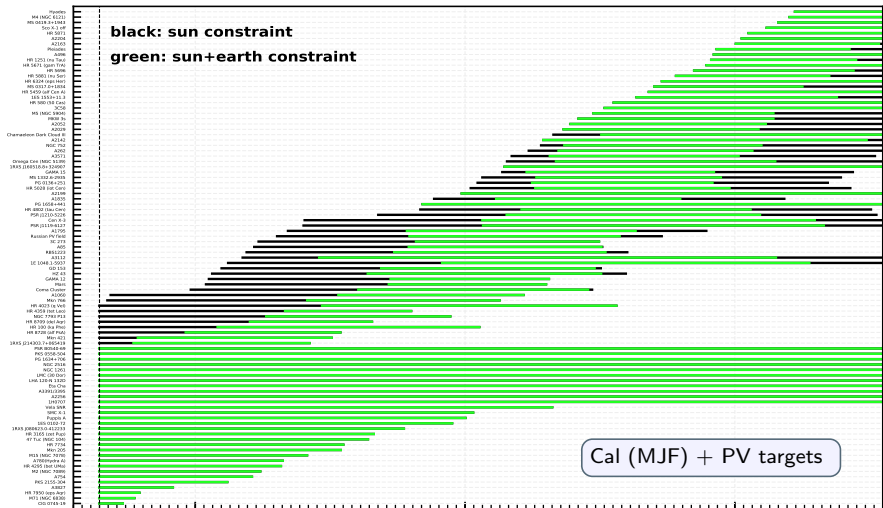
No major differences between spring/autumn SRG launch expected

eROSITA - visibility of CalPV targets

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec



eROSITA - next visibilities of targets



interval start: 2018-11-20, duration: 90.0 d



eROSITA Mission Timeline (UTC version):

Generated from mission planning file 'P.PLAN_180219_596948405_601424610.fits' at 2018-02-19.

extract from MPF (FITS)

TSTART	TSTOP	OBSTAT	OBSID	OBI	TARGET	REMARKS
2018-12-01 00:00:00	2018-12-01 00:05:31 :: 0.331 ks	SLW	300007	501	Slew	90.0 -66.56:84.68 -69.02
2018-12-01 00:05:31	2018-12-02 03:52:11 :: 100.0 ks	MPE	300007	1	LMC (30 Dor)	First Light
2018-12-02 03:52:11	2018-12-02 03:59:59 :: 0.468 ks	SLW	700129	501	Slew	84.68 -69.02:120.44 -60.87
2018-12-02 03:59:59	2018-12-02 09:33:19 :: 20.0 ks	CAL	700129	1	NGC 2516	2x2: step=25 arcmin, psb
2018-12-02 09:33:19	2018-12-02 09:38:27 :: 0.308 ks	SLW	700130	501	Slew	120.44 -60.87:118.73 -60.87
2018-12-02 09:38:27	2018-12-02 15:11:47 :: 20.0 ks	CAL	700130	1	NGC 2516	2x2: step=25 arcmin, psb
2018-12-02 15:11:47	2018-12-02 15:16:52 :: 0.305 ks	SLW	700131	501	Slew	118.73 -60.87:119.58 -60.45
2018-12-02 15:16:52	2018-12-02 20:50:12 :: 20.0 ks	CAL	700131	1	NGC 2516	2x2: step=25 arcmin, psb
2018-12-02 20:50:12	2018-12-02 20:55:20 :: 0.308 ks	SLW	700132	501	Slew	119.58 -60.45:119.58 -61.29
2018-12-02 20:55:20	2018-12-03 02:28:40 :: 20.0 ks	CAL	700132	1	NGC 2516	2x2: step=25 arcmin, psb
2018-12-03 02:28:40	2018-12-03 02:40:09 :: 0.689 ks	SLW	700117	501	Slew	119.58 -61.29:6.98 -72.08
2018-12-03 02:40:09	2018-12-03 08:13:29 :: 20.0 ks	CAL	700117	1	47 Tuc (NGC 104)	2x2: step=25 arcmin, fil
2018-12-03 08:13:29	2018-12-03 08:18:34 :: 0.305 ks	SLW	700118	501	Slew	6.98 -72.08:5.07 -72.08
2018-12-03 08:18:34	2018-12-03 13:51:54 :: 20.0 ks	CAL	700118	1	47 Tuc (NGC 104)	2x2: step=25 arcmin, fil
2018-12-03 13:51:54	2018-12-03 13:56:58 :: 0.304 ks	SLW	700119	501	Slew	5.07 -72.08:6.02 -71.79
2018-12-03 13:56:58	2018-12-03 19:30:18 :: 20.0 ks	CAL	700119	1	47 Tuc (NGC 104)	2x2: step=25 arcmin, fil
2018-12-03 19:30:18	2018-12-03 19:35:23 :: 0.305 ks	SLW	700120	501	Slew	6.02 -71.79:6.02 -72.38
2018-12-03 19:35:23	2018-12-04 01:08:43 :: 20.0 ks	CAL	700120	1	47 Tuc (NGC 104)	2x2: step=25 arcmin, fil
2018-12-04 01:08:43	2018-12-04 01:27:37 :: 1.134 ks	SLW	700011	501	Slew	6.02 -72.38:325.77 6.91
2018-12-04 01:27:37	2018-12-04 23:40:57 :: 80.0 ks	CAL	700011	1	1RXS J214303.7+065419	scr
2018-12-04 23:40:57	2018-12-05 00:00:10 :: 1.153 ks	SLW	700106	501	Slew	325.77 6.91:16.01 -72.03
2018-12-05 00:00:10	2018-12-05 16:40:10 :: 60.0 ks	CAL	700106	1	1ES 0102-72	on/+20/-20 arcmin off, cti
2018-12-05 16:40:10	2018-12-05 16:45:13 :: 0.303 ks	SLW	700107	501	Slew	16.01 -72.03:15.04 -71.89
2018-12-05 16:45:13	2018-12-06 09:25:13 :: 60.0 ks	CAL	700107	1	1ES 0102-72	on/+20/-20 arcmin off, cti
2018-12-06 09:25:13	2018-12-06 09:30:19 :: 0.306 ks	SLW	700108	501	Slew	15.04 -71.89:16.99 -72.17
2018-12-06 09:30:19	2018-12-07 02:10:19 :: 60.0 ks	CAL	700108	1	1ES 0102-72	on/+20/-20 arcmin off, cti
2018-12-07 02:10:19	2018-12-07 02:15:23 :: 0.304 ks	SLW	700109	501	Slew	16.99 -72.17:16.01 -71.83
2018-12-07 02:15:23	2018-12-07 16:08:43 :: 50.0 ks	CAL	700109	1	1ES 0102-72 off	12/18/24 arcmin off, off
2018-12-08 06:12:05	2018-12-08 20:05:25 :: 50.0 ks	CAL	700111	1	1ES 0102-72 off	12/18/24 arcmin off, off
2018-12-08 20:05:25	2018-12-08 20:37:39 :: 1.934 ks	SLW	700145	501	Slew	16.01 -71.63:248.62 70.53
2018-12-08 20:37:39	2018-12-09 07:44:19 :: 40.0 ks	CAL	700145	1	PG 1634+706	asterisk13, 12/24 arcmin, psf
2018-12-09 07:44:19	2018-12-09 07:49:21 :: 0.302 ks	SLW	700146	501	Slew	248.62 70.53:249.19 70.47

...cross-check + approval :: transformation + transmission :: observation...

...continued on next page



eRASS exposure - no changes

- eRASS8 - exposure in ecliptic plane
 - shallow + deep zones
 - $\sim 1.2 - 2.1$ ks (strategy dependent)
- eRASS8 - exposure at survey poles

Strategy	max. T_{exp}	Sky area [deg ²] with exposure					[ks]
	[ks]	≥ 10	≥ 15	≥ 20	≥ 30	≥ 40	
shallow	35	850	400	180	15	0	
medium	50	700	350	200	50	20	
deep	100	600	250	150	70	40	

- strategy type and location of poles are virtually independent
- 'global' all-sky exposure is virtually independent of chosen pole



eROSITA mission planning - current status

- D/RU collaboration at technical level in good shape
- general planning and data exchange procedures defined (some open details and TBDs)
- MPL software tests and mock-timeline runs successful

eROSITA mission planning - open/next steps

- launch date and orbit update
- complete tests of MPL ↔ SCC (IKI/NPOL) chain
- approval procedure + survey strategy



SRG launch...