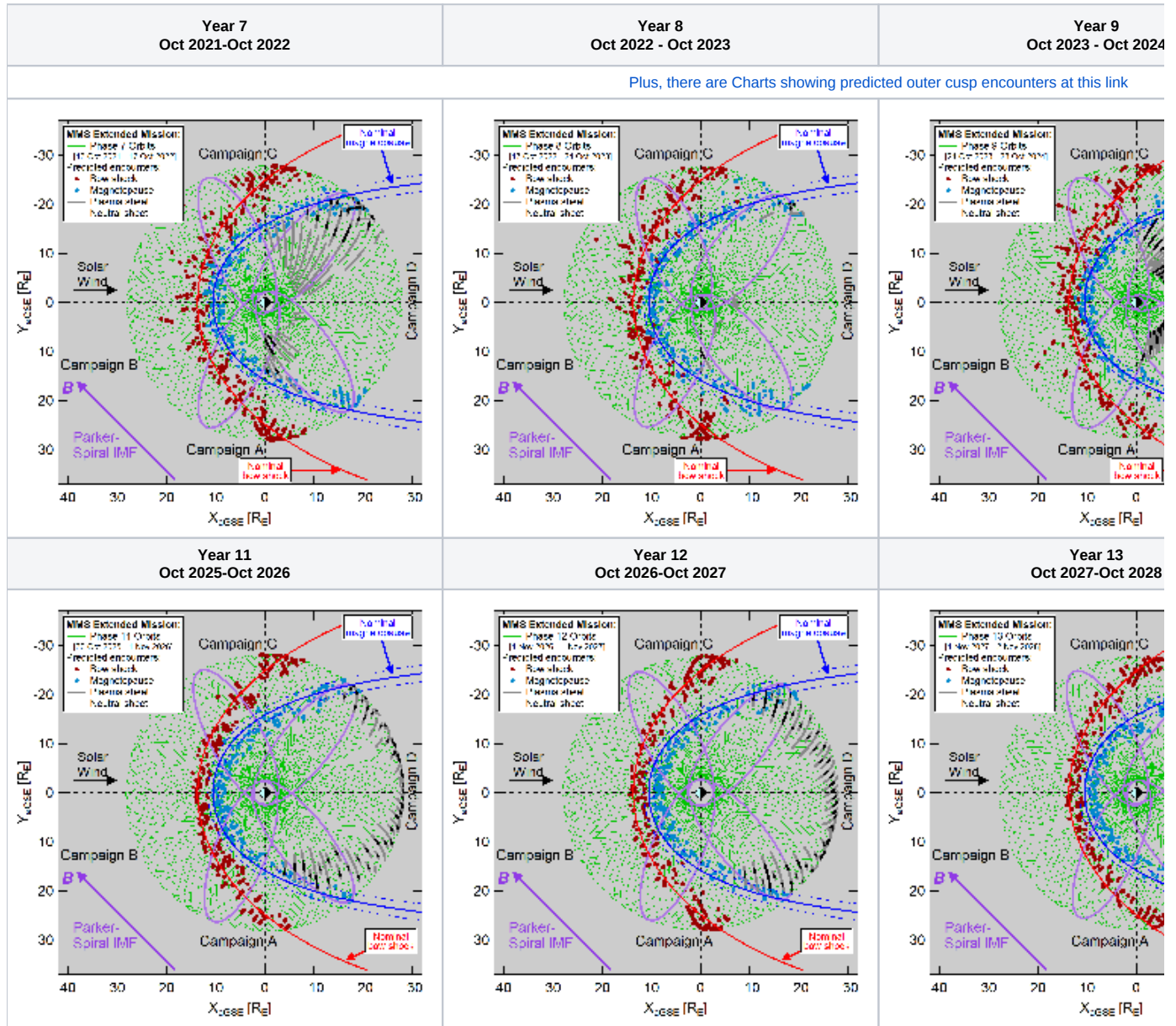
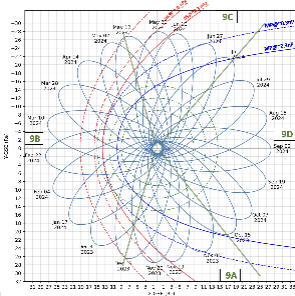


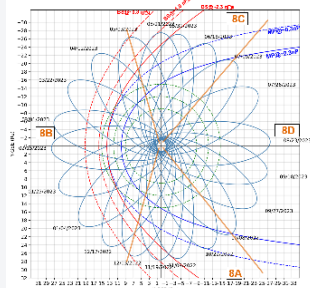
1.3 Mission Phases and Science Regions of Interest



Year 9	Phase	Region	Timeline Files from S. Petronec These are planning files, not actuals	Spacecraft Separations Additional Notes
Extended Mission 3 - Year 1 	Phase 9a	29 R _E Dusk Flank	MMS_orbit_Phase9A_and_conjunctions_v1a.pptx	
	Phase 9b	29 R _E Dayside	MMS_orbit_Phase9B_and_conjunctions_v1a.pptx	fast_mode_times_agse1_2023307-000000_2024176-000000_V007_v2a.txt
	Phase 9c	29 R _E Dawn Flank	MMS_orbit_Phase9C_and_conjunctions_v2.pptx	fast_mode_times_agse1_2024062-000000_2024301-000000_V005_v1_MMS1.txt fast_mode_times_agse1_2024062-000000_2024301-000000_V005_v1_MMS2.txt fast_mode_times_agse1_2024062-000000_2024301-000000_V005_v1_MMS3.txt fast_mode_times_agse1_2024062-000000_2024301-000000_V005_v1_MMS4.txt
	Phase 9d	29 R _E Nightside		

Year 8

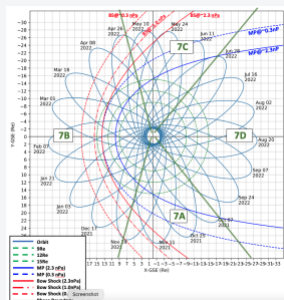
Extended Mission 2 - Year 3



Phase	Region	Timeline Files from S. Petrinec These are planning files, not actuals	Spacecraft Separations Additional Notes
Phase 8a:	29 R _E Dusk Flank	MMS_orbit_Phase8A_and_conjunctions_v1.pptx	
Phase 8b:	29 R _E Dayside	MMS_orbit_Phase8B_and_conjunctions_v1.pptx	
Phase 8c:	29 R _E Dawn Flank	MMS_orbit_Phase8C_and_conjunctions_v1.pptx	
Phase 8d:	29 R _E Nightside	MMS_orbit_Phase8D_and_conjunctions_v2.pptx	fast_mode_times_agse1_2023125-000000_2024002-000000_V005_v3.dat

Year 7

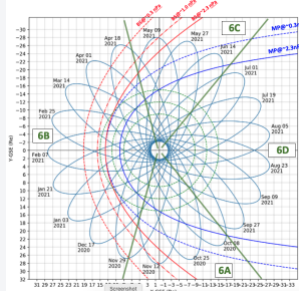
Extended Mission 2 - Year 2



Phase 7a: ~10/6/21-11/28/21	29 R _E Dusk Flank	MMS_Ph7_ConOps_20210809c.pptx MMS_Ph7A_ConOps_20210914.pptx	fast_mode_times_agse1_2021240-000000_2022114-000000_V004_v1.txt
Phase 7b: ~11/28/21-04/28/22	29 R _E Dayside	MMS_orbit_Phase7B_and_conjunctions.pptx	fast_mode_times_agse1_2021296-000000_2022171-000000_V004_v1.dat
Phase 7c: ~04/28/22-06/9/22	29 R _E Dawn Flank	MMS_orbit_Phase7C_and_conjunctions.pptx	
Phase 7d: ~06/9/22~10/10/22	29 R _E Nightside	MMS_orbit_Phase7D_and_conjunctions_v3.pptx MMS_orbit_Phase8B_and_conjunctions_v1.pptx (adjustments due to Artemis-1 Launch attempts)	fast_mode_times_agse1_2022107-000000_2022343-000000_V004_v3.dat LongShadows_update19July2022.pptx

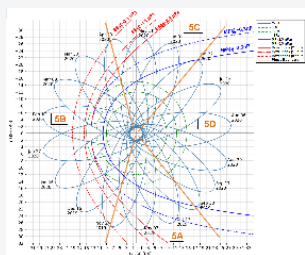
Year 6

Extended Mission 2 - Year 1



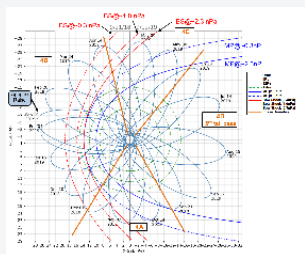
MMS_Year6_Orbits&Phases.png

Phase 6a: ~10/6/20-11/24/20	29 R _E Dusk Flank	MMS_Ph6A_ConOps_20200908[1].pptx	fast_mode_times_agse1_2020200-000000_2021075-000000_V005_v1.dat
Phase 6b: ~11/24/20-04/27/21	29 R _E Dayside	MMS_Ph6B_ConOps_20201118.pptx	Cluster_conjunctions_fast_mode_times_agse1_2020200-000000_2021075-000000_V005_v1.dat fast_mode_times_agse1_2020291-000000_2021159-000000_V004_v3.dat
Phase 6c: ~04/27/21-06/24/21	29 R _E Dawn Flank	MMS_Ph6C_ConOps_20210319.pptx	fast_mode_times_agse1_2021030-000000_2021268-000000_V005_v2.dat
Phase 6d: ~06/24/21~10/10/21	29 R _E Nightside	MMS_Ph6D_ConOps_20210518.pptx	fast_mode_times_agse1_2021121-000000_2021360-000000_V005_v2.dat

Extended Mission 1 -
Year 3

MMS Year5 Orbits&Phases.png

Phase 5a: ~09/30/1019 - 11/24/2019	29 R _E Dusk Flank	MMS_EM5A_orbits_20190821.pptx timelines_orbs1046_1061.pdf fast_mode_times_agse1_EM5A.dat offsets submitted	3 SROI
Phase 5b: ~11/24/2019 - 04/23/2020	29 R _E Dayside	MMS_Ph5B_ConOps_20191029.pptx	3 SROI Parker Solar Probe perihelion alignment 11/28-11/30 - formation resize to <20km> 11/26 (DOY 330) - 34% moon shadow 12/27 (DOY 361) - 73% moon shadow - timeline Solar Wind SROI: FPI electrons: 4eV-940eV / FPI ions: 197eV-9222eV
Phase 5c: ~04/23/2020 - 06/19/2020	29 R _E Dawn Flank	MMS_Ph5C_ConOps_20200227.pptx	Formation resize to 40km: planned for 4/14-16/2020
Phase 5d: ~06/22/2020 - 10/02/2020	29 R _E Nightside	MMS_Ph5D_ConOps_20200519.pptx	Long Eclipses (~5.124 hr): 8/13/2020 and 8/17/2020

Extended Mission 1 -
Year 2

MMS Year4 Orbits&Phases.png

MMS_2019Orbits_GSE.tiff

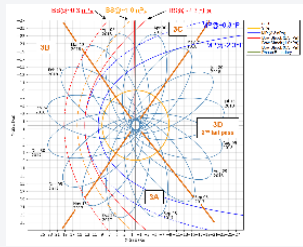
[illegible]

SWCampaign timeline.jpeg

Phase 4a: September 28, 2018	25R _E Dusk Flank (Dwell time outside BS (0.3 nPa < 10 hrs)	MMS_4A_SROIs_v2.pptx	3 SROI 20 km Oct 18
Phase 4b: November 29, 2018	25R _E Dayside (Dwell time outside BS (0.3 nPa) > 10 hrs)	before apogee raise: MMS_half4B_SROIs_v2.pptx after apogee raise: MMS_4B_turbulencampaign_SROIs_Final.pptx + timeline charts Ref: from Ergun --> guidelines for Solar Wind Turbulence Campaign Ref: from MOC --> TurbulenceCampaignFinalDates.ppt	3 SROI Apogee raise to 29R _E 20 km Mar 13 Solar Wind Turbulence Campaign
Phase 4c: ~April 16, 2019 - ~June 28, 2019	29R _E Dawn Flank (Dwell time outside BS (2.3 nPa) < 10 hrs)	MMS_proposed_SROIs_EM4C_26mar2019.zip	3 SROI 40 km May 22
Phase 4d: ~June 29, 2019 - ~September 29, 2019	1st 29R _E Nightside (Apogee within avg. MP (~2.3 nP))	MMS_EM4D_orbits_20190520.pptx	3 SROI 06/04/2019 (DOY 155) 09:17:13.29495 - MMS3 Processor reset 30 km Sep 8

Extended Mission 1 - Year 1

Phase 3a: September 1, 2017	25R _E Dusk Flank	MMS_3a_SROIs_792-817_dusk_timelines.pdf	1 SROI Perigee Raise Oct 3 30 km Oct 11 20 km Nov 8
Phase 3b: November 14, 2017	25R _E Dayside	MMS_3b_SROIs_818-860_dayside_timelines.pdf	3 SROI, 1st use of SW modes
Phase 3c: March 13, 2018	25R _E Dawn Flank	MMS_orbs_860_885_mp_timelines.pdf xy_aGSE_orb EMC_mp_bs_sw_final.png	3 SROI 40 km May 16



MMS_Year3_Orbits&Phases.png

Phase 3d:
May 25, 2018

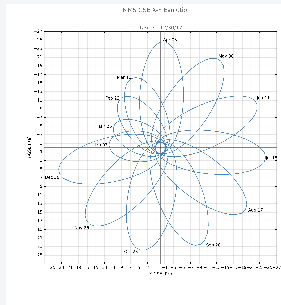
2nd 25R_E
Nightside

[MMS_3d_SROIs_886_930_mtail_timelines.pdf](#)

3 SROI

Year 2

Prime Mission - Year 2



MMS_2017Orbits_GSE.png

Phase 2a:
January 31, 2017

Apogee raise,
Dawn

No science ROIs planned in
Phase 2A

No FPI ops
60 km Feb 1
Apogee Raise Feb 9
160 km Apr 26

Phase 2b:
May 1, 2017

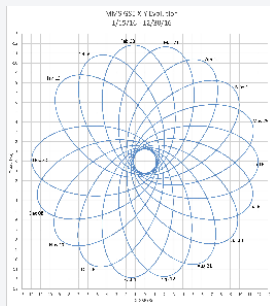
1st 25R_E
Nightside
Completion of
Prime Mission

[MMS_2b_SROIs_748-793_mtail_timelines.pdf](#)

1 SROI
60 km May 18
30 km Jun 1
20 km Jun 29

Year 1

Prime Mission - Year 1



MMS_2016Orbits_GSE.jpg

Phase 1a:
September 1,
2015

1st 12R_E
Dayside

[Petricin_UPDATE_Sliding_ROI_timelines_ph1a.pdf](#)

60 km DOY 259/260 (Sept 16/17)
25 km DOY 273/274 (Sept 30/Oct 1)
10 km DOY 287/288 (Oct 14/15)
40 km Dec 16
10 km Jan 13

Phase 1x:
March 8, 2016

12R_E Dawn,
Nightside, Dusk

No science ROIs planned in
Phase 1x

No FPI Ops
40 km Mar 24
10 km Sep 1

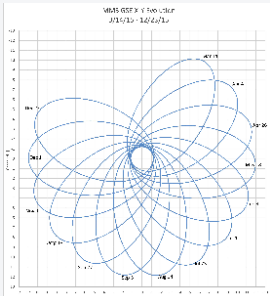
Phase 1b:
Sept 12, 2016

2nd 12R_E
Dayside

[MMS_ph1b_avg13.5hr_pref1_v2.pdf](#)

7 km Sep 15

Commissioning:



MMS_2015Orbits_GSE.jpg

March 15, 2015

Nightside -->
Dusk Flank

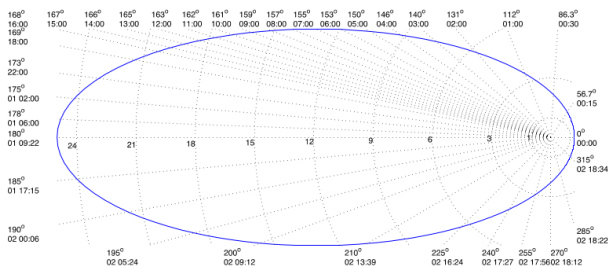
160 km DOY 188/190 (July 7/9)

Selected datasets only
BBF campaign

12R_E Orbit

similar graphic needs to be created

25R_E Orbit



MMS_25RE_Orbit.jpg

29R_E Orbit

similar graphic needs to be created