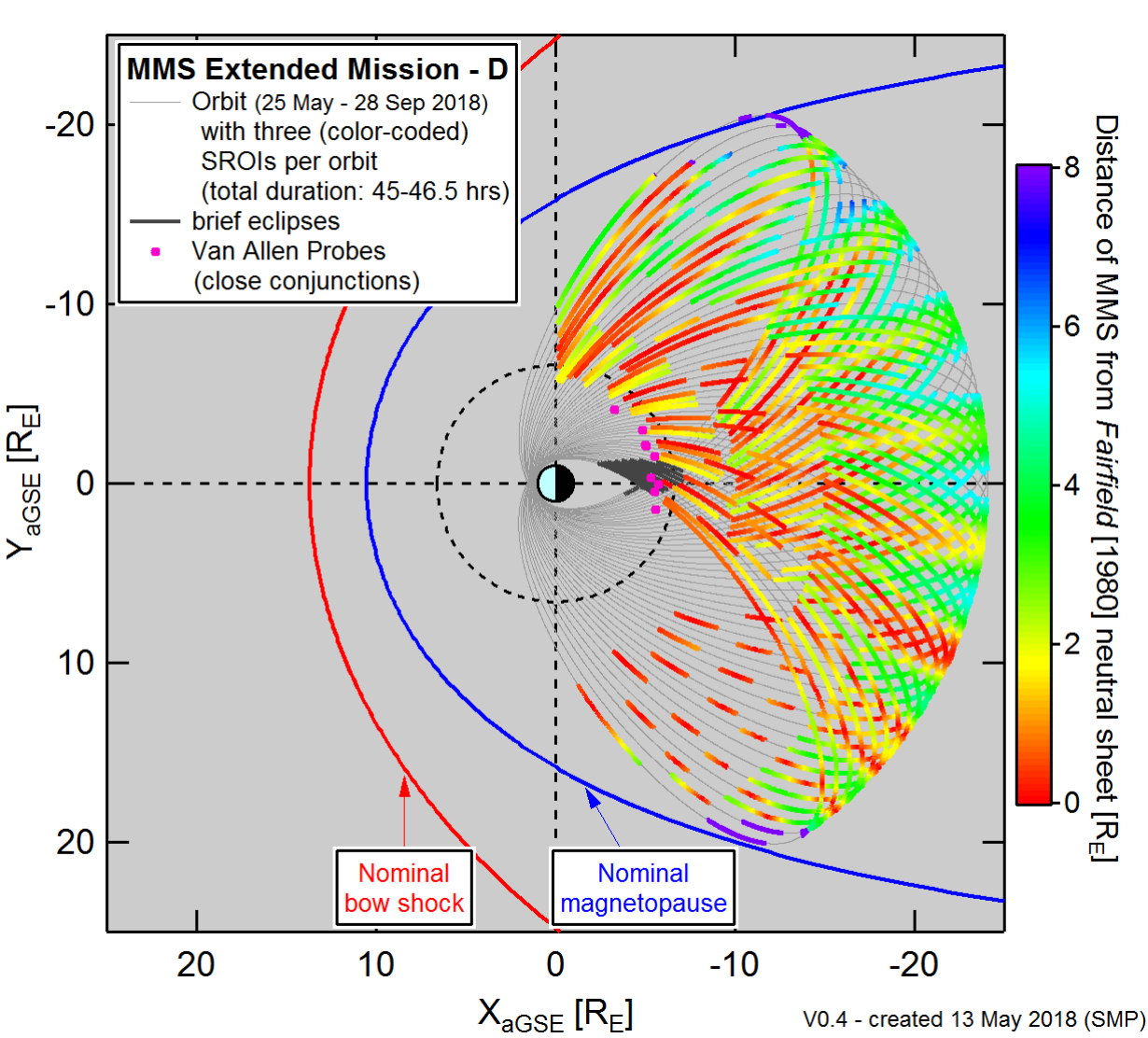
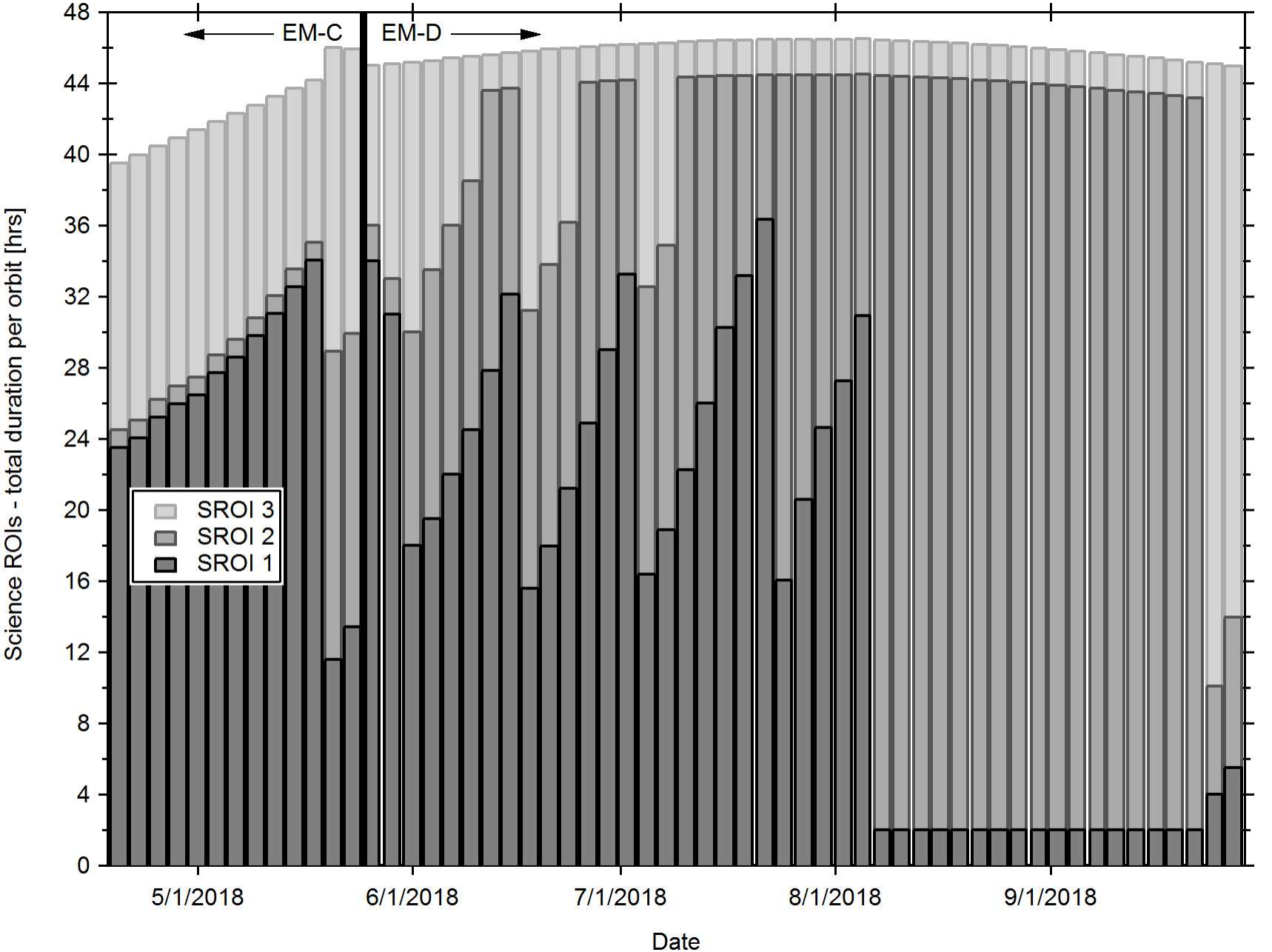
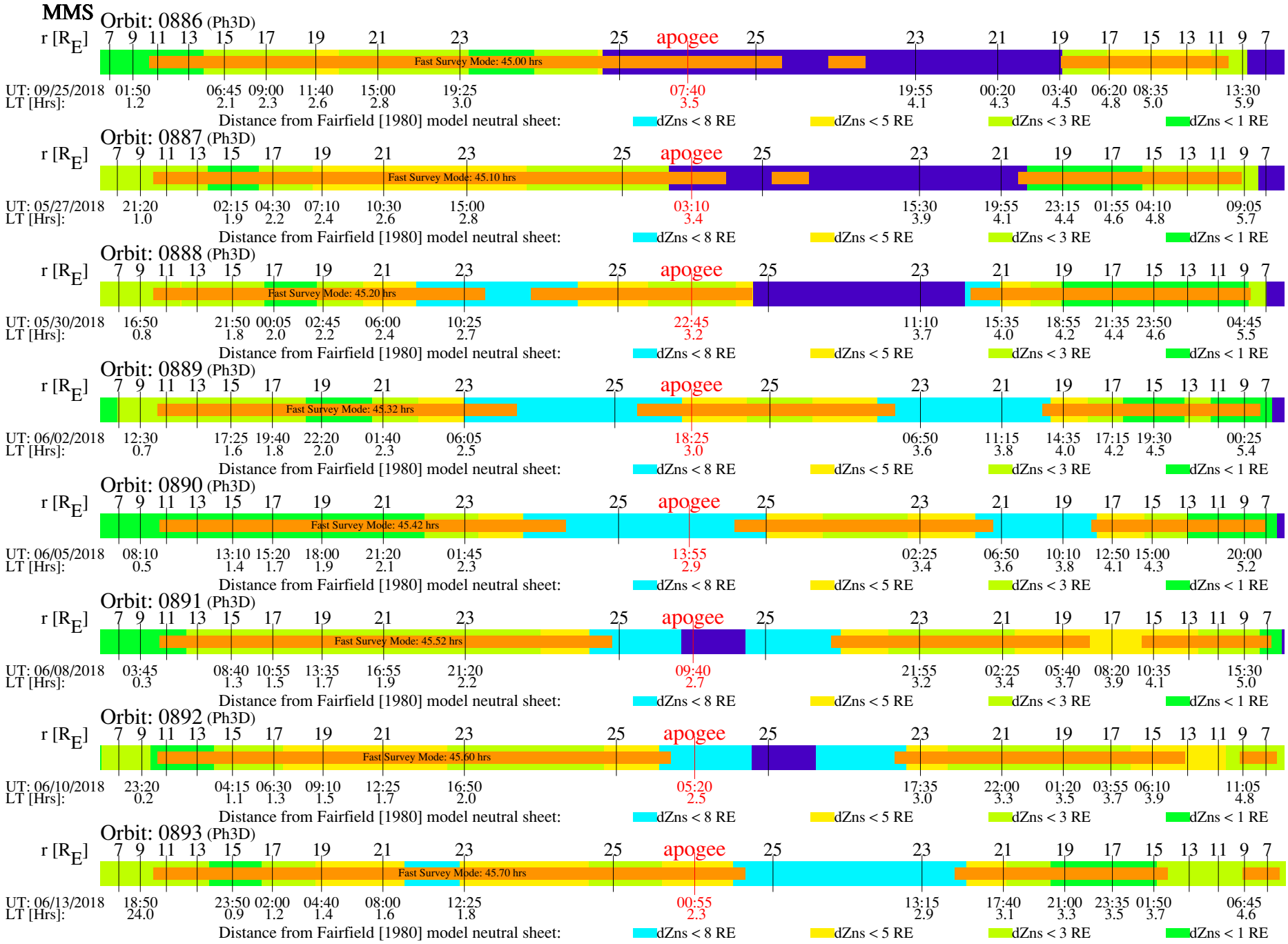
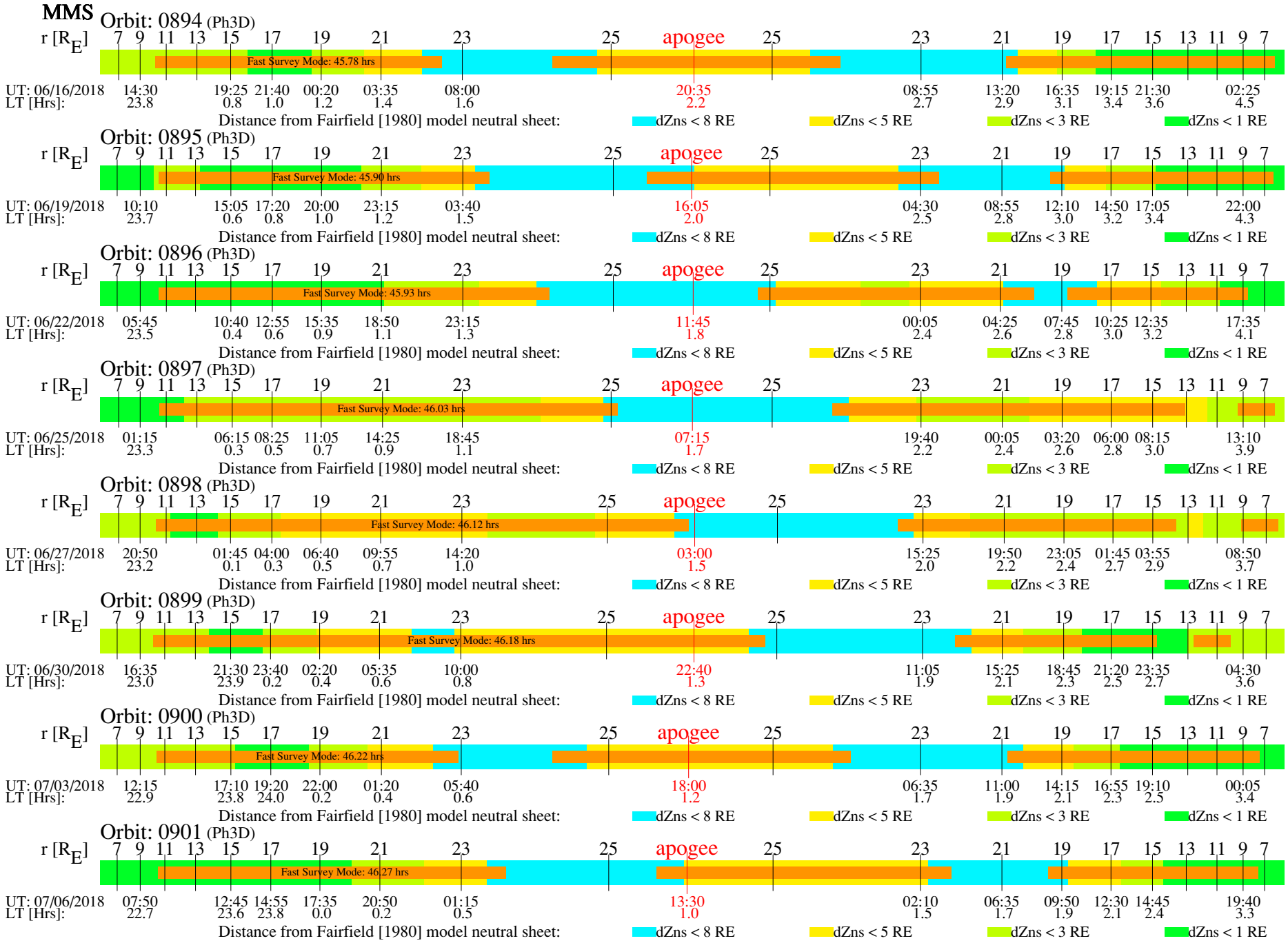

MMS Extended Mission - D
Orbit (25 May - 28 Sep 2018)
with three (color-coded)
SROIs per orbit
(total duration: 45-46.5 hrs)
brief eclipses
Van Allen Probes
(close conjunctions)
Nominal
bow shock
Nominal
magnetopause
Distance of MMS from Fairfield [1980] neutral sheet [R_E]
8
6
4
2
0
-20
-10
0
10
20
Y_aGSE [R_E]
20
10
0
-10
-20
X_aGSE [R_E]
V0.4 - created 13 May 2018 (SMP)

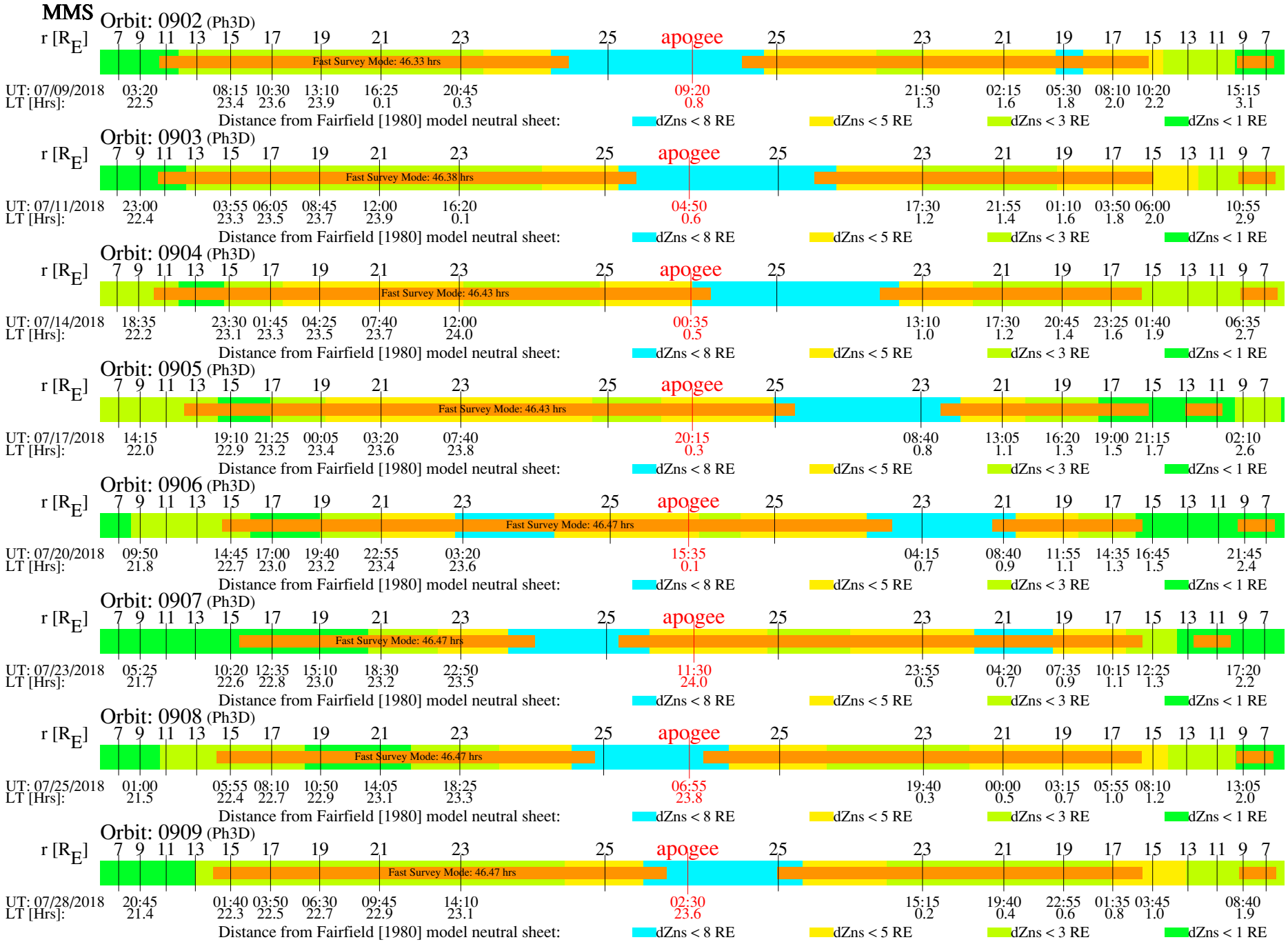

EM-C
EM-D
SROI 3
SROI 2
SROI 1
Science ROIs - total duration per orbit [hrs]
0
4
8
12
16
20
24
28
32
36
40
44
48
5/1/2018
6/1/2018
7/1/2018
8/1/2018
9/1/2018
Date


MMS
Orbit: 0886 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 45.00 hrs
UT: 09/25/2018 01:50 06:45 09:00 11:40 15:00 19:25 07:40 19:55 00:20 03:40 06:20 08:35 13:30
LT [Hrs]: 1.2 2.1 2.3 2.6 2.8 3.0 3.5 4.1 4.3 4.5 4.8 5.0 5.9
Orbit: 0887 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 45.10 hrs
UT: 05/27/2018 21:20 02:15 04:30 07:10 10:30 15:00 03:10 15:30 19:55 23:15 01:55 04:10 09:05
LT [Hrs]: 1.0 1.9 2.2 2.4 2.6 2.8 3.4 3.9 4.1 4.4 4.6 4.8 5.7
Orbit: 0888 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 45.20 hrs
UT: 05/30/2018 16:50 21:50 00:05 02:45 06:00 10:25 22:45 11:10 15:35 18:55 21:35 23:50 04:45
LT [Hrs]: 0.8 1.8 2.0 2.2 2.4 2.7 3.2 3.7 4.0 4.2 4.4 4.6 5.5
Orbit: 0889 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 45.32 hrs
UT: 06/02/2018 12:30 17:25 19:40 22:20 01:40 06:05 18:25 06:50 11:15 14:35 17:15 19:30 00:25
LT [Hrs]: 0.7 1.6 1.8 2.0 2.3 2.5 3.0 3.6 3.8 4.0 4.2 4.5 5.4
Orbit: 0890 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 45.42 hrs
UT: 06/05/2018 08:10 13:10 15:20 18:00 21:20 01:45 13:55 02:25 06:50 10:10 12:50 15:00 20:00
LT [Hrs]: 0.5 1.4 1.7 1.9 2.1 2.3 2.9 3.4 3.6 3.8 4.1 4.3 5.2
Orbit: 0891 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 45.52 hrs
UT: 06/08/2018 03:45 08:40 10:55 13:35 16:55 21:20 09:40 21:55 02:25 05:40 08:20 10:35 15:30
LT [Hrs]: 0.3 1.3 1.5 1.7 1.9 2.2 2.7 3.2 3.4 3.7 3.9 4.1 5.0
Orbit: 0892 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 45.60 hrs
UT: 06/10/2018 23:20 04:15 06:30 09:10 12:25 16:50 05:20 17:35 22:00 01:20 03:55 06:10 11:05
LT [Hrs]: 0.2 1.1 1.3 1.5 1.7 2.0 2.5 3.0 3.3 3.5 3.7 3.9 4.8
Orbit: 0893 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 45.70 hrs
UT: 06/13/2018 18:50 23:50 02:00 04:40 08:00 12:25 00:55 13:15 17:40 21:00 23:35 01:50 06:45
LT [Hrs]: 24.0 0.9 1.2 1.4 1.6 1.8 2.3 2.9 3.1 3.3 3.5 3.7 4.6
Distance from Fairfield [1980] model neutral sheet:
dZns < 8 RE
dZns < 5 RE
dZns < 3 RE
dZns < 1 RE

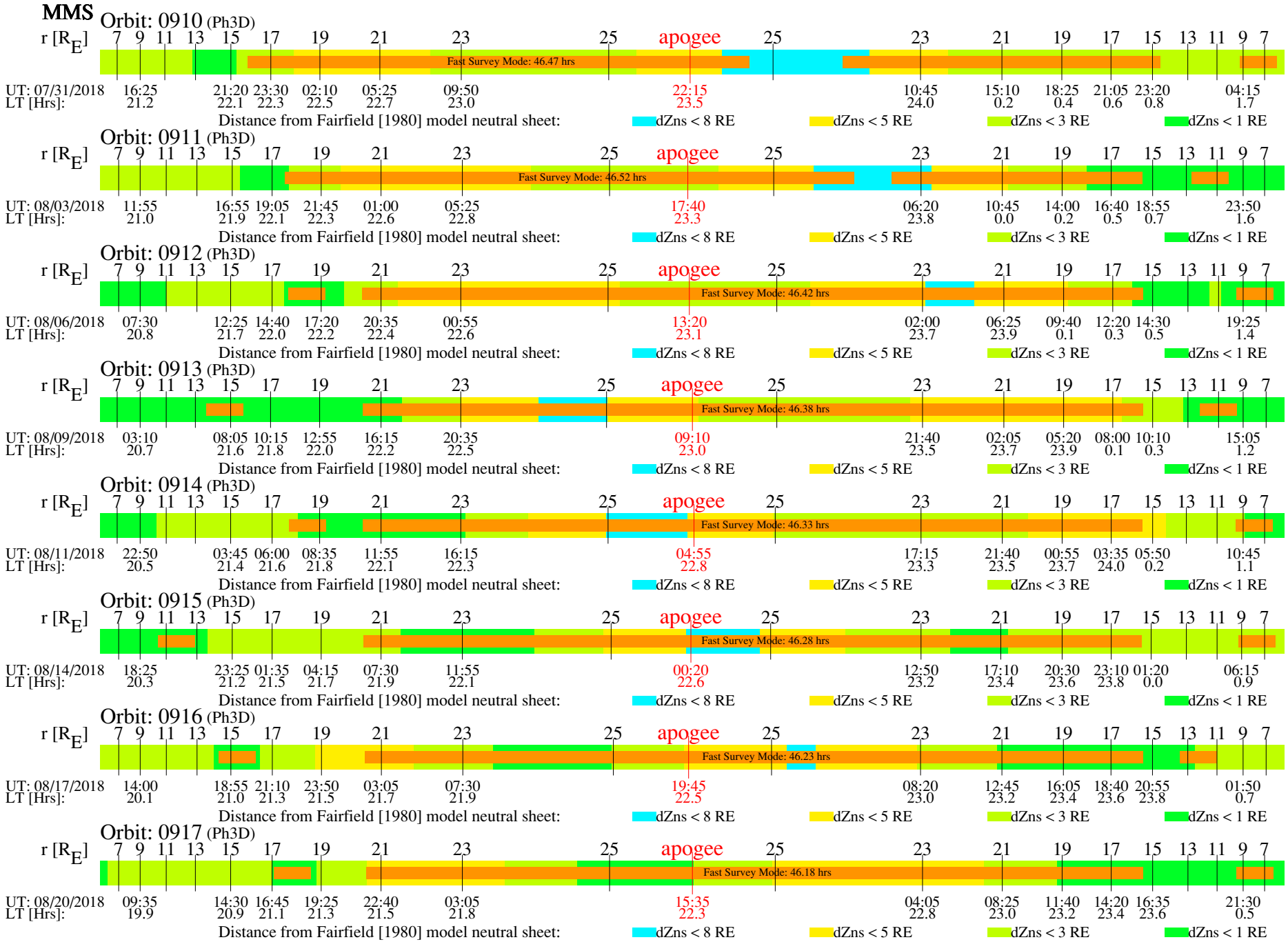
MMS


Orbit: 0894 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 45.78 hrs
UT: 06/16/2018 14:30 19:25 21:40 00:20 03:35 08:00 20:35 08:55 13:20 16:35 19:15 21:30 02:25
LT [Hrs]: 23.8 0.8 1.0 1.2 1.4 1.6 2.2 2.7 2.9 3.1 3.4 3.6 4.5
Orbit: 0895 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 45.90 hrs
UT: 06/19/2018 10:10 15:05 17:20 20:00 23:15 03:40 16:05 04:30 08:55 12:10 14:50 17:05 22:00
LT [Hrs]: 23.7 0.6 0.8 1.0 1.2 1.5 2.0 2.5 2.8 3.0 3.2 3.4 4.3
Orbit: 0896 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 45.93 hrs
UT: 06/22/2018 05:45 10:40 12:55 15:35 18:50 23:15 11:45 00:05 04:25 07:45 10:25 12:35 17:35
LT [Hrs]: 23.5 0.4 0.6 0.9 1.1 1.3 1.8 2.4 2.6 2.8 3.0 3.2 4.1
Orbit: 0897 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 46.03 hrs
UT: 06/25/2018 01:15 06:15 08:25 11:05 14:25 18:45 07:15 19:40 00:05 03:20 06:00 08:15 13:10
LT [Hrs]: 23.3 0.3 0.5 0.7 0.9 1.1 1.7 2.2 2.4 2.6 2.8 3.0 3.9
Orbit: 0898 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 46.12 hrs
UT: 06/27/2018 20:50 01:45 04:00 06:40 09:55 14:20 03:00 15:25 19:50 23:05 01:45 03:55 08:50
LT [Hrs]: 23.2 0.1 0.3 0.5 0.7 1.0 1.5 2.0 2.2 2.4 2.7 2.9 3.7
Orbit: 0899 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 46.18 hrs
UT: 06/30/2018 16:35 21:30 23:40 02:20 05:35 10:00 22:40 11:05 15:25 18:45 21:20 23:35 04:30
LT [Hrs]: 23.0 23.9 0.2 0.4 0.6 0.8 1.3 1.9 2.1 2.3 2.5 2.7 3.6
Orbit: 0900 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 46.22 hrs
UT: 07/03/2018 12:15 17:10 19:20 22:00 01:20 05:40 18:00 06:35 11:00 14:15 16:55 19:10 00:05
LT [Hrs]: 22.9 23.8 24.0 0.2 0.4 0.6 1.2 1.7 1.9 2.1 2.3 2.5 3.4
Orbit: 0901 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 46.27 hrs
UT: 07/06/2018 07:50 12:45 14:55 17:35 20:50 01:15 13:30 02:10 06:35 09:50 12:30 14:45 19:40
LT [Hrs]: 22.7 23.6 23.8 0.0 0.2 0.5 1.0 1.5 1.7 1.9 2.1 2.4 3.3
Distance from Fairfield [1980] model neutral sheet:
dZns < 8 RE
dZns < 5 RE
dZns < 3 RE
dZns < 1 RE

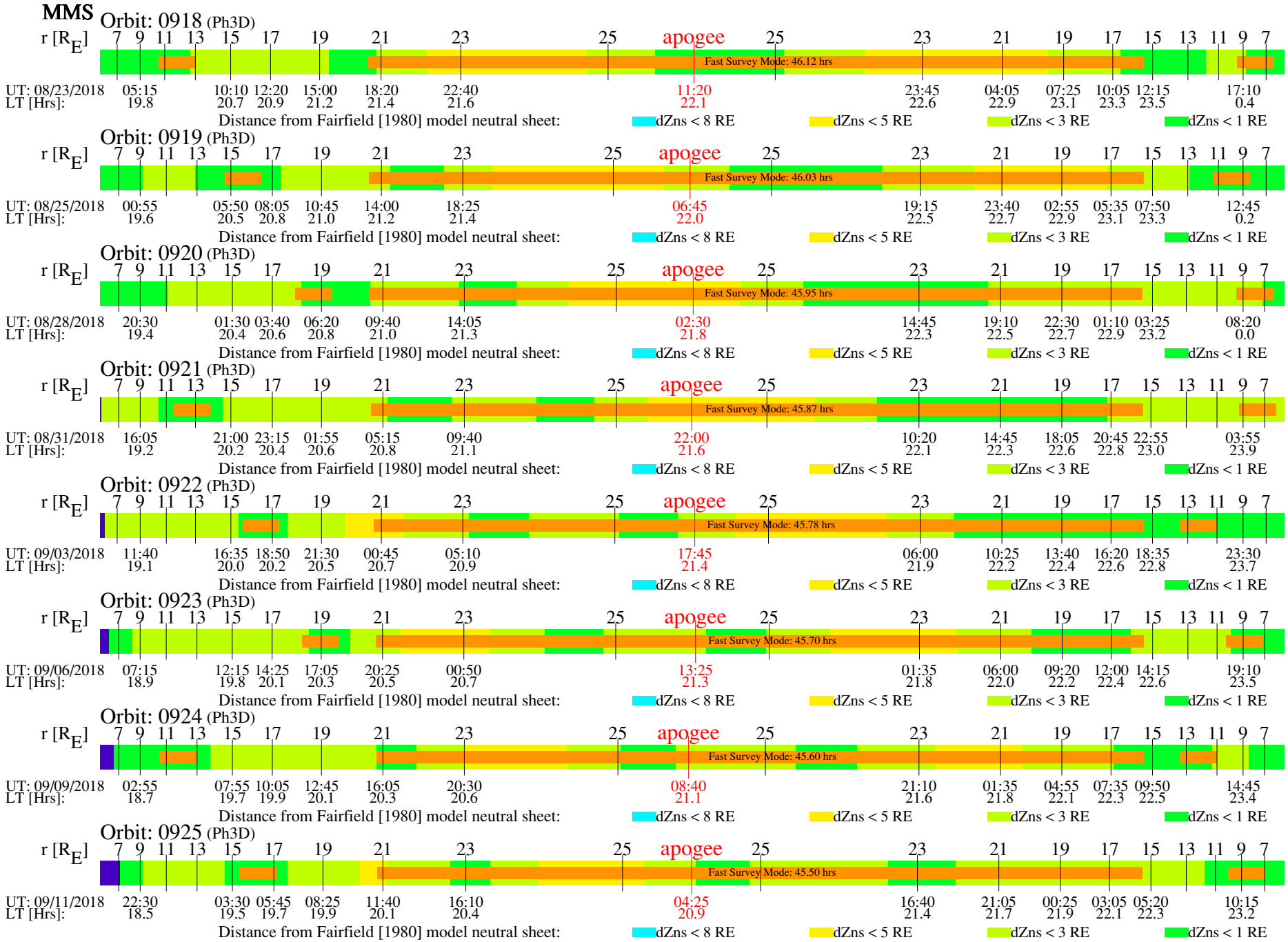
MMS

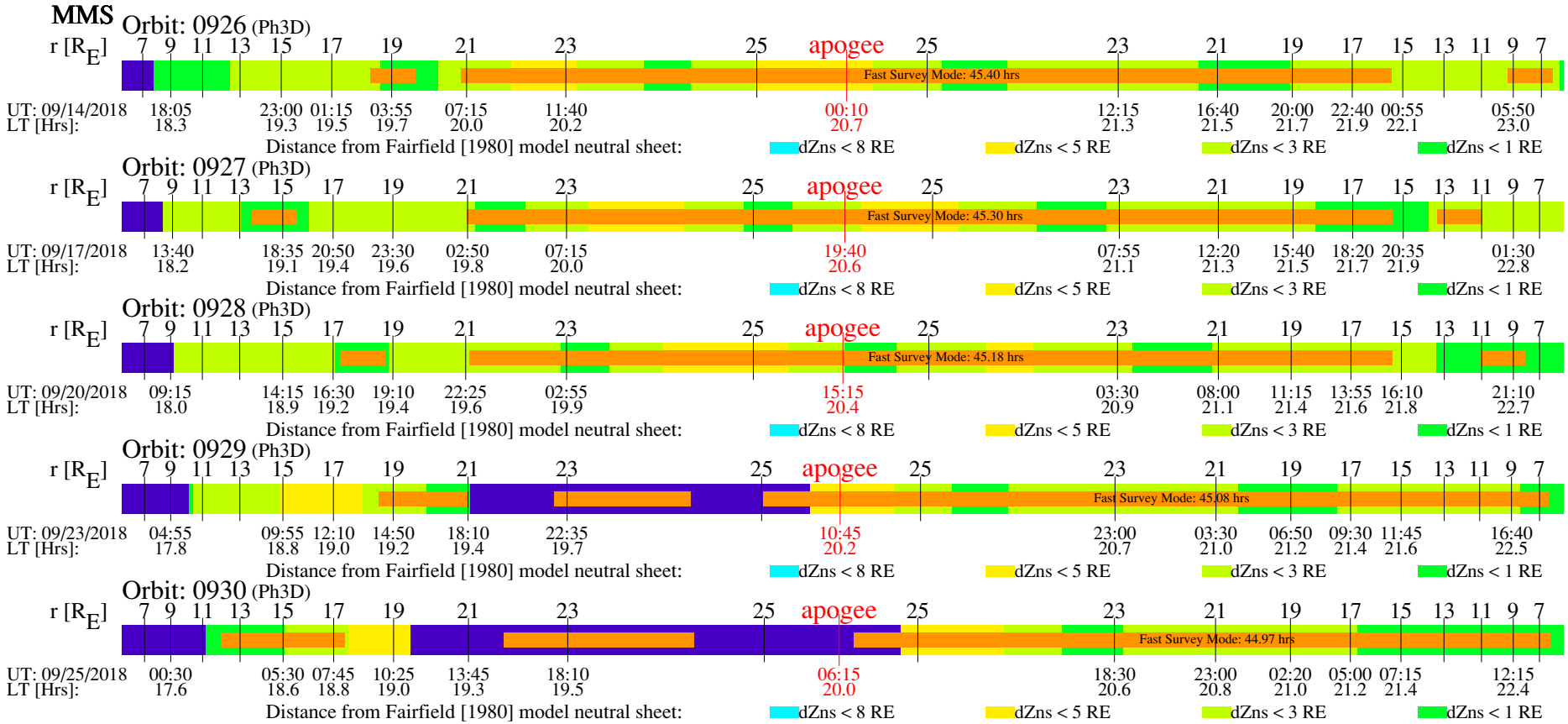

Orbit: 0902 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 46.33 hrs
UT: 07/09/2018 03:20 08:15 10:30 13:10 16:25 20:45 09:20 21:50 02:15 05:30 08:10 10:20 15:15
LT [Hrs]: 22.5 23.4 23.6 23.9 0.1 0.3 0.8 1.3 1.6 1.8 2.0 2.2 3.1
Orbit: 0903 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 46.38 hrs
UT: 07/11/2018 23:00 03:55 06:05 08:45 12:00 16:20 04:50 17:30 21:55 01:10 03:50 06:00 10:55
LT [Hrs]: 22.4 23.3 23.5 23.7 23.9 0.1 0.6 1.2 1.4 1.6 1.8 2.0 2.9
Orbit: 0904 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 46.43 hrs
UT: 07/14/2018 18:35 23:30 01:45 04:25 07:40 12:00 00:35 13:10 17:30 20:45 23:25 01:40 06:35
LT [Hrs]: 22.2 23.1 23.3 23.5 23.7 24.0 0.5 1.0 1.2 1.4 1.6 1.9 2.7
Orbit: 0905 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 46.43 hrs
UT: 07/17/2018 14:15 19:10 21:25 00:05 03:20 07:40 20:15 08:40 13:05 16:20 19:00 21:15 02:10
LT [Hrs]: 22.0 22.9 23.2 23.4 23.6 23.8 0.3 0.8 1.1 1.3 1.5 1.7 2.6
Orbit: 0906 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 46.47 hrs
UT: 07/20/2018 09:50 14:45 17:00 19:40 22:55 03:20 15:35 04:15 08:40 11:55 14:35 16:45 21:45
LT [Hrs]: 21.8 22.7 23.0 23.2 23.4 23.6 0.1 0.7 0.9 1.1 1.3 1.5 2.4
Orbit: 0907 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 46.47 hrs
UT: 07/23/2018 05:25 10:20 12:35 15:10 18:30 22:50 11:30 23:55 04:20 07:35 10:15 12:25 17:20
LT [Hrs]: 21.7 22.6 22.8 23.0 23.2 23.5 24.0 0.5 0.7 0.9 1.1 1.3 2.2
Orbit: 0908 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 46.47 hrs
UT: 07/25/2018 01:00 05:55 08:10 10:50 14:05 18:25 06:55 19:40 00:00 03:15 05:55 08:10 13:05
LT [Hrs]: 21.5 22.4 22.7 22.9 23.1 23.3 23.8 0.3 0.5 0.7 1.0 1.2 2.0
Orbit: 0909 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 46.47 hrs
UT: 07/28/2018 20:45 01:40 03:50 06:30 09:45 14:10 02:30 15:15 19:40 22:55 01:35 03:45 08:40
LT [Hrs]: 21.4 22.3 22.5 22.7 22.9 23.1 23.6 0.2 0.4 0.6 0.8 1.0 1.9
Distance from Fairfield [1980] model neutral sheet:
dZns < 8 RE
dZns < 5 RE
dZns < 3 RE
dZns < 1 RE

MMS


Orbit: 0910 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 46.47 hrs
UT: 07/31/2018 16:25 21:20 23:30 02:10 05:25 09:50 22:15 10:45 15:10 18:25 21:05 23:20 04:15
LT [Hrs]: 21.2 22.1 22.3 22.5 22.7 23.0 23.5 24.0 0.2 0.4 0.6 0.8 1.7
Orbit: 0911 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 46.52 hrs
UT: 08/03/2018 11:55 16:55 19:05 21:45 01:00 05:25 17:40 06:20 10:45 14:00 16:40 18:55 23:50
LT [Hrs]: 21.0 21.9 22.1 22.3 22.6 22.8 23.3 23.8 0.0 0.2 0.5 0.7 1.6
Orbit: 0912 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 46.42 hrs
UT: 08/06/2018 07:30 12:25 14:40 17:20 20:35 00:55 13:20 02:00 06:25 09:40 12:20 14:30 19:25
LT [Hrs]: 20.8 21.7 22.0 22.2 22.4 22.6 23.1 23.7 23.9 0.1 0.3 0.5 1.4
Orbit: 0913 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 46.38 hrs
UT: 08/09/2018 03:10 08:05 10:15 12:55 16:15 20:35 09:10 21:40 02:05 05:20 08:00 10:10 15:05
LT [Hrs]: 20.7 21.6 21.8 22.0 22.2 22.5 23.0 23.5 23.7 23.9 0.1 0.3 1.2
Orbit: 0914 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 46.33 hrs
UT: 08/11/2018 22:50 03:45 06:00 08:35 11:55 16:15 04:55 17:15 21:40 00:55 03:35 05:50 10:45
LT [Hrs]: 20.5 21.4 21.6 21.8 22.1 22.3 22.8 23.3 23.5 23.7 24.0 0.2 1.1
Orbit: 0915 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 46.28 hrs
UT: 08/14/2018 18:25 23:25 01:35 04:15 07:30 11:55 00:20 12:50 17:10 20:30 23:10 01:20 06:15
LT [Hrs]: 20.3 21.2 21.5 21.7 21.9 22.1 22.6 23.2 23.4 23.6 23.8 0.0 0.9
Orbit: 0916 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 46.23 hrs
UT: 08/17/2018 14:00 18:55 21:10 23:50 03:05 07:30 19:45 08:20 12:45 16:05 18:40 20:55 01:50
LT [Hrs]: 20.1 21.0 21.3 21.5 21.7 21.9 22.5 23.0 23.2 23.4 23.6 23.8 0.7
Orbit: 0917 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 46.18 hrs
UT: 08/20/2018 09:35 14:30 16:45 19:25 22:40 03:05 15:35 04:05 08:25 11:40 14:20 16:35 21:30
LT [Hrs]: 19.9 20.9 21.1 21.3 21.5 21.8 22.3 22.8 23.0 23.2 23.4 23.6 0.5
Distance from Fairfield [1980] model neutral sheet:
dZns < 8 RE
dZns < 5 RE
dZns < 3 RE
dZns < 1 RE

MMS


Orbit: 0918 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 46.12 hrs
UT: 08/23/2018 05:15 10:10 12:20 15:00 18:20 22:40 11:20 23:45 04:05 07:25 10:05 12:15 17:10
LT [Hrs]: 19.8 20.7 20.9 21.2 21.4 21.6 22.1 22.6 22.9 23.1 23.3 23.5 0.4
Orbit: 0919 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 46.03 hrs
UT: 08/25/2018 00:55 05:50 08:05 10:45 14:00 18:25 06:45 19:15 23:40 02:55 05:35 07:50 12:45
LT [Hrs]: 19.6 20.5 20.8 21.0 21.2 21.4 22.0 22.5 22.7 22.9 23.1 23.3 0.2
Orbit: 0920 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 45.95 hrs
UT: 08/28/2018 20:30 01:30 03:40 06:20 09:40 14:05 02:30 14:45 19:10 22:30 01:10 03:25 08:20
LT [Hrs]: 19.4 20.4 20.6 20.8 21.0 21.3 21.8 22.3 22.5 22.7 22.9 23.2 0.0
Orbit: 0921 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 45.87 hrs
UT: 08/31/2018 16:05 21:00 23:15 01:55 05:15 09:40 22:00 10:20 14:45 18:05 20:45 22:55 03:55
LT [Hrs]: 19.2 20.2 20.4 20.6 20.8 21.1 21.6 22.1 22.3 22.6 22.8 23.0 23.9
Orbit: 0922 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 45.78 hrs
UT: 09/03/2018 11:40 16:35 18:50 21:30 00:45 05:10 17:45 06:00 10:25 13:40 16:20 18:35 23:30
LT [Hrs]: 19.1 20.0 20.2 20.5 20.7 20.9 21.4 21.9 22.2 22.4 22.6 22.8 23.7
Orbit: 0923 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 45.70 hrs
UT: 09/06/2018 07:15 12:15 14:25 17:05 20:25 00:50 13:25 01:35 06:00 09:20 12:00 14:15 19:10
LT [Hrs]: 18.9 19.8 20.1 20.3 20.5 20.7 21.3 21.8 22.0 22.2 22.4 22.6 23.5
Orbit: 0924 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 45.60 hrs
UT: 09/09/2018 02:55 07:55 10:05 12:45 16:05 20:30 08:40 21:10 01:35 04:55 07:35 09:50 14:45
LT [Hrs]: 18.7 19.7 19.9 20.1 20.3 20.6 21.1 21.6 21.8 22.1 22.3 22.5 23.4
Orbit: 0925 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 45.50 hrs
UT: 09/11/2018 22:30 03:30 05:45 08:25 11:40 16:10 04:25 16:40 21:05 00:25 03:05 05:20 10:15
LT [Hrs]: 18.5 19.5 19.7 19.9 20.1 20.4 20.9 21.4 21.7 21.9 22.1 22.3 23.2
Distance from Fairfield [1980] model neutral sheet:
dZns < 8 RE
dZns < 5 RE
dZns < 3 RE
dZns < 1 RE


MMS
Orbit: 0926 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 45.40 hrs
UT: 09/14/2018 18:05 23:00 01:15 03:55 07:15 11:40 00:10 12:15 16:40 20:00 22:40 00:55 05:50
LT [Hrs]: 18.3 19.3 19.5 19.7 20.0 20.2 20.7 21.3 21.5 21.7 21.9 22.1 23.0
Orbit: 0927 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 45.30 hrs
UT: 09/17/2018 13:40 18:35 20:50 23:30 02:50 07:15 19:40 07:55 12:20 15:40 18:20 20:35 01:30
LT [Hrs]: 18.2 19.1 19.4 19.6 19.8 20.0 20.6 21.1 21.3 21.5 21.7 21.9 22.8
Orbit: 0928 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 45.18 hrs
UT: 09/20/2018 09:15 14:15 16:30 19:10 22:25 02:55 15:15 03:30 08:00 11:15 13:55 16:10 21:10
LT [Hrs]: 18.0 18.9 19.2 19.4 19.6 19.9 20.4 20.9 21.1 21.4 21.6 21.8 22.7
Orbit: 0929 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 45.08 hrs
UT: 09/23/2018 04:55 09:55 12:10 14:50 18:10 22:35 10:45 23:00 03:30 06:50 09:30 11:45 16:40
LT [Hrs]: 17.8 18.8 19.0 19.2 19.4 19.7 20.2 20.7 21.0 21.2 21.4 21.6 22.5
Orbit: 0930 (Ph3D)
r [R_E] 7 9 11 13 15 17 19 21 23 25 apogee 25 23 21 19 17 15 13 11 9 7
Fast Survey Mode: 44.97 hrs
UT: 09/25/2018 00:30 05:30 07:45 10:25 13:45 18:10 06:15 18:30 23:00 02:20 05:00 07:15 12:15
LT [Hrs]: 17.6 18.6 18.8 19.0 19.3 19.5 20.0 20.6 20.8 21.0 21.2 21.4 22.4
Distance from Fairfield [1980] model neutral sheet:
dZns < 8 RE
dZns < 5 RE
dZns < 3 RE
dZns < 1 RE