Chapter 2 - Orbit Overview

Contents

Introduction to Chapter 2

This chapter gives an overview of the NIMS observations in the E14 Orbit.

The text on page 3 summarizes the NIMS science objectives for E14. The NIMS calibrations are discussed on page 3. Early data return and E14 playback are also discussed on page 3.

The table on page 4 is a time-ordered listing of the NIMS Oapels for E14.

The plot on page 5 shows the geometry of the NIMS E14 observations using a north trajectory pole view projection. The plot on page 6 shows the NIMS Europa regional observations along the trajectory of the E14 Europa flyby. The plot on page 7 shows the geometry of the NIMS E14 calibrations.

The table on page 8 lists various NIMS E14 observing parameters: target latitude/longitude, range, cone angle, incidence angle (light), emission angle (view) and phase angle.

The spreadsheet on page 9 summarizes the various inputs for the NIMS E14 Observations. The spreadsheet on pages 10 and 11 summarizes the resource usage for the NIMS E14 observations.

The timeline on page 12 shows the placement of the E14 observations for all intruments during the E14 Encounter Period.

The tapemap on page 13 shows the placement of the E14 observations on the spacecraft's tape recorder.

The timeline on pages 14 through 22 shows the preliminary E14 playback schedule.

The NIMS E14 mosaic designs are summarized on page 23 and 24 in time-order.

NIMS E14 SCIENCE OVERVIEW

Jupiter Science

There are two realtime Jupiter observations in E14. Both observations look at the North Equatorial Belt region at about 7 degrees North. JUPRTS01 returns 10 Rims of 408 wavelengths in gain state 2. JUPRTS02 returns 20 Rims of 408 wavelengths, 11 nightside Rims in gains state 4 and 9 dayside Rims in gain state 2.

Io Science

INHRSPEC is a high spatial and spectral resolution observation of Io’s dayside, covered in two swaths.

Europa Science

There are seven Europa observations planned for E14: Four regional observations and three distant global observations. ICERAF is a regional mosaic which covers prominent intersecting linea. SUCOMP01 is a single swath that includes dark spots and a pull-apart wedge-shaped area. SUCOMP02 is a single swath that covers bright plains, wedges and dark material. SUCOMP03 is a single-nimsel swath (Long Spectrometer) that crosses intersecting triple-band terrain. EUR15H, EUR17H and EUR20H are distant global observation that observe Europa at 15, 17 and 20 hours after closest approach. Each of the global observations consist of two identical swaths, the first in gain state 3, the second in gain state 4.

Callisto Science

CNGLOBAL is a global mosaic of Callisto in three swaths.

Ganymede Science

Ganymede was not observed in E14.

Calibration

There are three NIMS calibration observations planned for E14: one PCT cal, one RCT cal and one OPCAL.

Early Data Return

There are five realtime observations in E14: Two 408 wavelength Jupiter observations (JUPRTS), one PCT calibration, one RCT calibration and one OPCAL

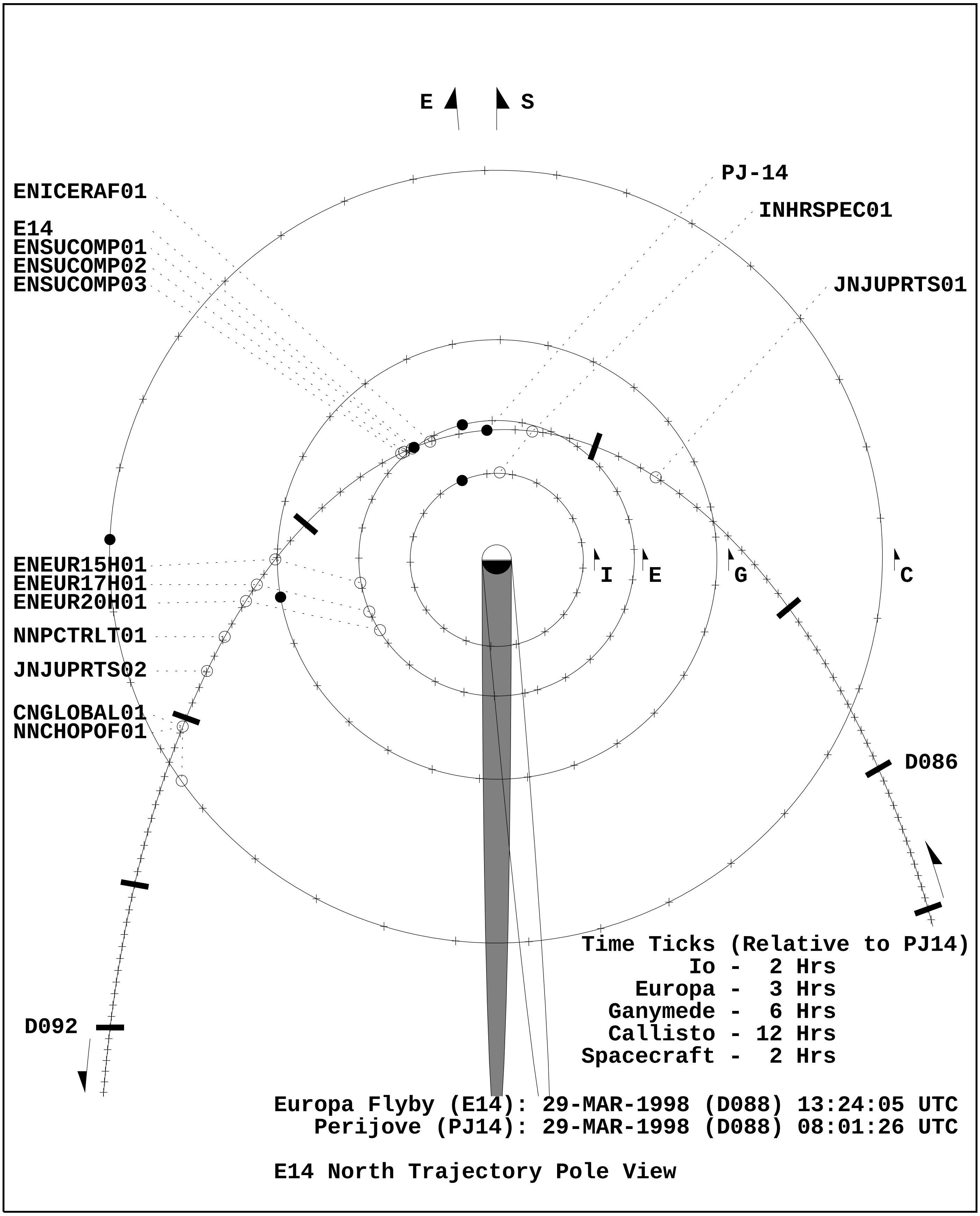
E14 Playback

E14 playback is split into two passes through the tape.

E14 Time-Ordered Listing

OAPEL	Start (UTC)	End (UTC)	Duration
14NNJUPRTS01-	98-087/18:20:20	98-087/18:24:23	000/00:04:02
14JNJUPRTS01*	98-087/18:28:25	98-087/18:44:36	000/00:16:10
14NNHRSPEC01-	98-088/04:42:10	98-088/04:46:13	000/00:04:02
14INHRSPEC01-	98-088/04:46:13	98-088/05:11:29	000/00:25:16
14NNICERAF01-	98-088/11:59:59	98-088/12:04:01	000/00:04:02
14ENICERAF01-	98-088/12:07:03	98-088/12:50:32	000/00:43:28
14NNSUCOMP01-	98-088/13:25:55	98-088/13:28:57	000/00:03:02
14ENSUCOMP01-	98-088/13:29:58	98-088/13:51:12	000/00:21:14
14NNSUCOMP02-	98-088/14:01:19	98-088/14:05:21	000/00:04:02
14ENSUCOMP02-	98-088/14:05:21	98-088/14:20:31	000/00:15:10
14NNSUCOMP03-	98-088/14:20:31	98-088/14:24:34	000/00:04:02
14ENSUCOMP03-	98-088/14:24:34	98-088/14:47:49	000/00:23:15
14NNEUR15H01-	98-089/04:10:39	98-089/04:14:41	000/00:04:02
14ENEUR15H01-	98-089/04:14:41	98-089/04:41:59	000/00:27:18
14NNEUR17H01-	98-089/07:10:37	98-089/07:14:40	000/00:04:02
14ENEUR17H01-	98-089/07:15:41	98-089/07:41:58	000/00:26:17
14NNEUR20H01-	98-089/09:10:57	98-089/09:14:59	000/00:04:02
14ENEUR20H01-	98-089/09:14:59	98-089/09:42:17	000/00:27:18
14NNPCTRLT01-	98-089/13:36:05	98-089/14:40:41	000/01:04:36
14NNJUPRTS02-	98-089/17:49:39	98-089/17:53:41	000/00:04:09
14JNJUPRTS02*	98-089/17:54:42	98-089/18:20:59	000/00:26:17
14NNGLOBAL01-	98-090/00:57:21	98-090/01:01:23	000/00:04:02
14CNGLOBAL01*	98-090/01:06:27	98-090/01:39:49	000/00:33:22
14NNCHOPOF01-	98-090/01:52:57	98-090/01:59:01	000/00:06:04
14NNRCTRLT01-	98-132/07:59:34	98-132/21:22:23	000/13:22:49

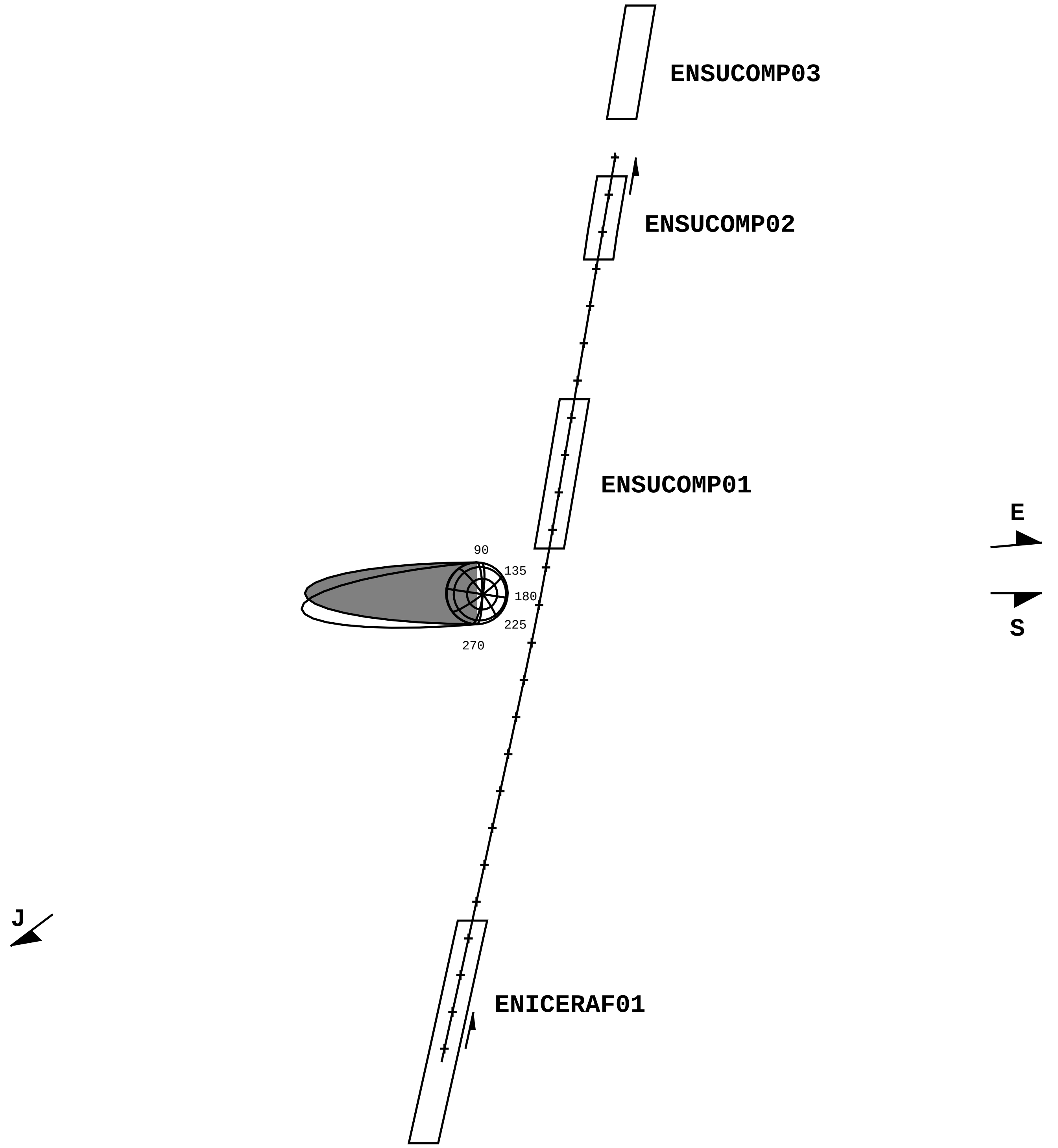
NIMS E14 OBSERVATIONS



NIMS E14 EUROPA FLYBY OBSERVATIONS

Europa Flyby (E14): 29-MAR-1998 (D088) 13:24:05 UTC

Time Ticks (Relative to E14)
Spacecraft - 5 Minutes

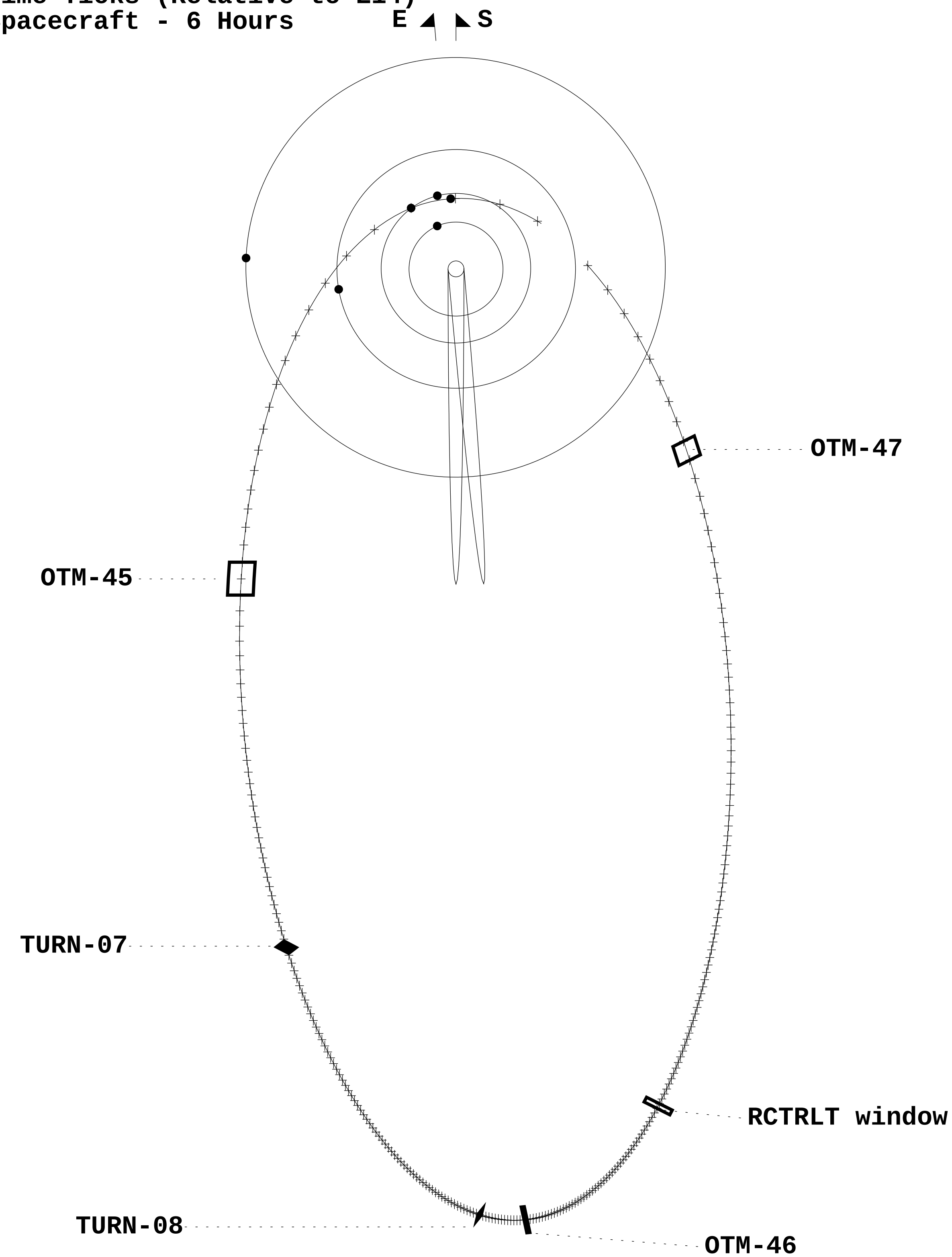


E14 North Trajectory Pole View, +/- 1 Hour

NIMS E14 CRUISE CALIBRATIONS

Europa Flyby (E14): 29-MAR-1998 (D088) 13:24:05 UTC
Perijove (PJ14): 29-MAR-1998 (D088) 08:01:26 UTC
Apojove (AJ14): 30-APR-1998 (D120) 16:00:00 UTC

Time Ticks (Relative to E14)
Spacecraft - 6 Hours



E14 North Trajectory Pole View, Perijove to Perijove

NIMS E14 OBSERVING GEOMETRY

OAPEL	Latitude (deg)	Longitude (deg)	Range (km)	Cone (deg)	Light (deg)	View (deg)	Phase (deg)
14JNJUPRTS01	+3 to +10	327 to 349	800K	113	62 to 89	8 to 30	61
14INHRSPEC01	-90 to +90	123 to 303	250K	140	26 to 121	26 to 90	34
14ENICERAF01	-10 to +15	267 to 286	20K	80	54 to 71	23 to 43	95
14ENSUCOMP01	-30 to -25	162 to 185	8K	128	44 to 62	35 to 50	58
14ENSUCOMP02	-20 to -10	164 to 182	20K	112	41 to 60	23 to 39	74
14ENSUCOMP03	+20 to +90	172 to 214	27K	109	21 to 52	30 to 68	76
14ENEUR15H01	-90 to +90	181 to 296	440K	109	0 to 100	0 to 90	76
14ENEUR17H01	-90 to +90	189 to 307	570K	108	4 to 105	0 to 90	77
14ENEUR20H01	-90 to +90	196 to 314	670K	106	11 to 106	0 to 90	79
14JNJUPRTS02	+3 to +10	350 to 90	1430K	75	38 to 136	1 to 74	110
14CNGLOBAL01	-90 to +90	210 to 30	230K	170	2 to 95	2 to 90	3

E14 NIMS INPUTS

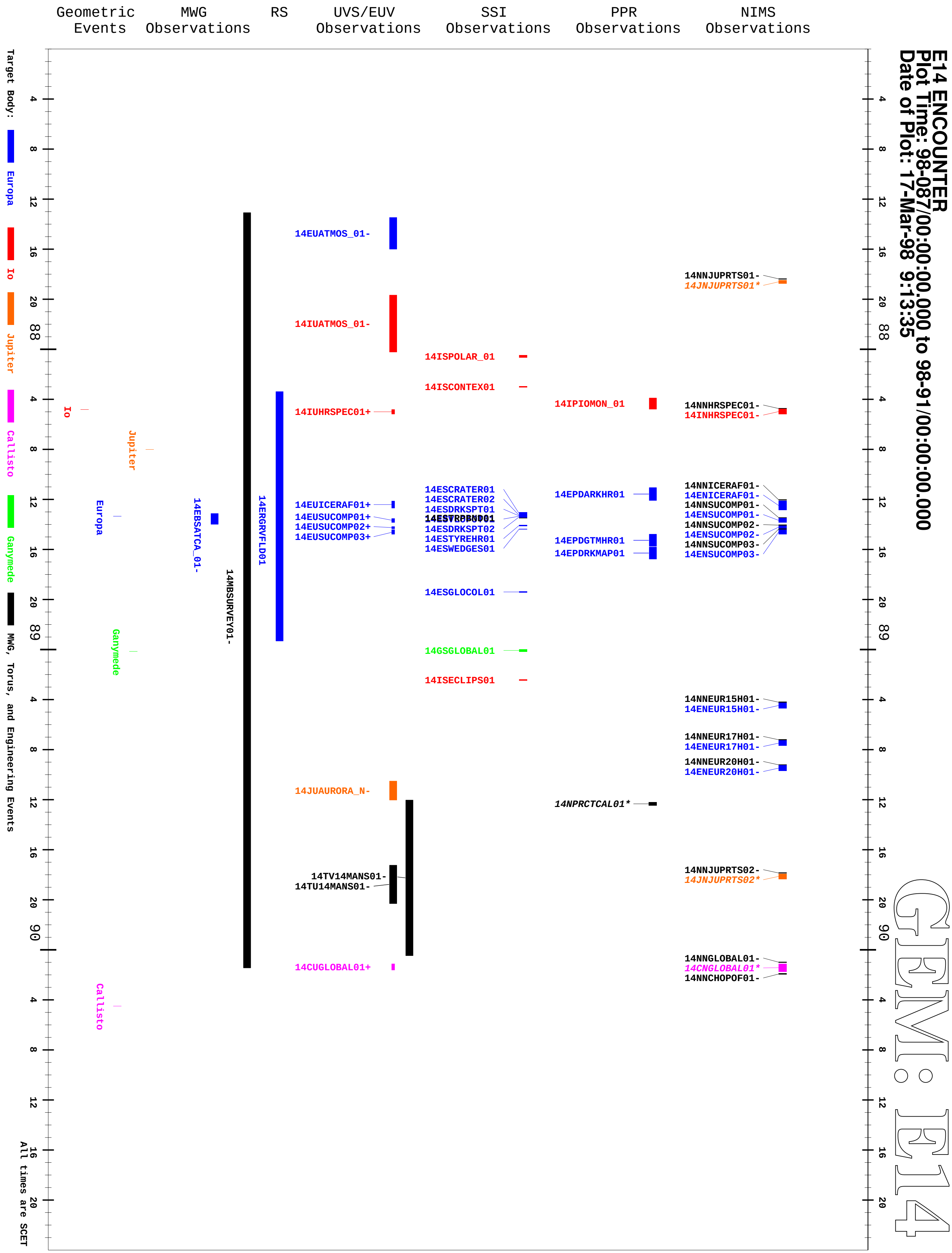
Activity ID	Observation Title	NIMS Edit Table	NIMS PB Table	Mode	Gain	Grating Start	Grating Offset	Record Format	PSID
14NNJUPRTS01-	NIMS Software Reload								DA
14JNJUPRTS01*	Jupiter Realtime Observation	E14JLM442/MB	R/T	LM	2	0	4	R/T	DA
14NNHRSPEC01-	NIMS Software Reload								DB
14INHRSPEC01-	Io Monitoring at High Spectral Resolutio	E14ILM442	E14B_ILM324	LM	2	0	4	MPW	DB
14NNICERAF01-	NIMS Software Reload								DC
14ENICERAF01-	Europa Ice Rift	E14ELM442		LM	2	0	4	MPW	DC
14NNSUCOMP01-	NIMS Software Reload								DD
14ENSUCOMP01-	Europa Surface Composition	E14ELM442	E14ELM360	LM	2	0	4	MPW	DD
14NNSUCOMP02-	NIMS Software Reload								DE
14ENSUCOMP02-	Europa Surface Composition	E14ELM442	E14ELM360	LM	2	0	4	MPW	DE
14NNSUCOMP03-	NIMS Software Reload								DF
14ENSUCOMP03-	Europa Surface Composition	E14ELM442	E14ELM360	LS	2	0	4	MPW	DF
14NNEUR15H01-	NIMS Software Reload								DI
14ENEUR15H01-	Europa Obs at Plus 15 Hours	E14B_ELM240V	E14B_ELM168V	LM	3	0	4	LPU	DI
14ENEUR15H01-	Europa Obs at Plus 15 Hours	E14ELM442	E14B_ELM240T	LM	4	0	4	MPW	EI
14NNEUR17H01-	NIMS Software Reload								DJ
14ENEUR17H01-	Europa Obs beyond 15 Rj	E14B_ELM240V	E14B_ELM240V	LM	3	0	4	LPU	DJ
14ENEUR17H01-	Europa Obs beyond 15 Rj	E14B_ELM240T	E14B_ELM240T	LM	4	0	4	LPU	EJ
14NNEUR20H01-	NIMS Software Reload								DK
14ENEUR20H01-	Europa Obs beyond 15 Rj	E14B_ELM240V	E14B_ELM240V	LM	3	0	4	LPU	DK
14ENEUR20H01-	Europa Obs beyond 15 Rj	E14B_ELM240T	E14B_ELM240T	LM	4	0	4	LPU	EK
14NNPCTRLT01-	NIMS Real-Time PCT Calibration	E14PCT252	R/T	LM	4	0	4	R/T	FA
14NNJUPRTS02-	NIMS Software Reload								DG
14JNJUPRTS02*	Jupiter Realtime Observation	E14JLM442/MB	R/T	LM	4,2	0	4	R/T	DG
14NNGLOBAL01-	NIMS Software Reload								DH
14CNGLOBAL01*	Callisto Global Map	E14CLM243C		LM	4	0	4	LPU	DH
14NNCHOPOF01-	Chopper off								DL
14NNRCTRLT01-	NIMS RCT Real-Time Calibration	E14RCT252	R/T	LM	1	0	4	R/T	XE

E14 NIMS RESOURCES

Activity ID	NIMS Mode	Record Mode	Obs. Cost (tracks)	Obs. Cost (ticks)	Number Wavelengths Returned	Obs Record (sec.)	Obs Playback (sec.)	Selected Bits to Tape sBOT (MBITS)	Bits to Tape MBOT (Mbit)	Mode Cycle time (sec)
14JNJUPRTS01	LM	R/T			360					
14INHRSPEC01	LM	MPW	0.168353689	980.996948	324	1113.32	481	5.54112	12.8254464	8.667
14ENICERAF01	LM	MPW	0.285001382	1660.703052	360	1886.68	121	1.39392	21.7345536	8.667
14ENSUCOMP01	LM	MPW	0.172377896	1004.446	360	1140	460	5.2992	13.1328	8.667
14ENSUCOMP02	LM	MPW	0.099978377	582.574	360	660	3.335	0.0384192	7.6032	8.667
14ENSUCOMP03	LS	MPW	0.172377896	1004.446	360	1140	182	2.09664	13.1328	8.667
14ENEUR15H01	LM	LPU	0.012010131	69.983032	168	290.03	285.36	1.76010048	1.78890504	8.667
14ENEUR15H01	LM	MPW	0.043268436	252.125178	240	284.02	283.33	3.2639616	3.2719104	8.667
14ENEUR17H01	LM	LPU	0.010105002	58.881848	240	242.67	0	0	1.49678856	8.667
14ENEUR17H01	LM	LPU	0.010105002	58.881848	240	242.67	240.67	1.48445256	1.49678856	8.667
14ENEUR20H01	LM	LPU	0.008603346	50.131696	240	205.34	0	0	1.26653712	8.667
14ENEUR20H01	LM	LPU	0.008603346	50.131696	240	205.34	196.67	1.21306056	1.26653712	8.667
14NNRCTRLT01	LM	R/T			252					
14JNJUPRTS02	LM	R/T			360					8.667
14CNGLOBAL01	LM	LPU	0.090424111	526.901296	15	2239.34	868	5.353824	13.81224912	8.667
14CNGLOBAL01	LM	LPU	0.090424111	526.901296	228	2239.34	495.33	3.05519544	13.81224912	8.667
14CNGLOBAL01	LM	LPU	0.090424111	526.901296	15	2239.34	850.67	5.24693256	13.81224912	8.667
14NNRCTRLT01	LM	R/T			252					
14INHRSPEC01	LM	MPW	0.168353689	980.996948	324	1113.32	481	5.54112	12.8254464	8.667
14ENICERAF01	LM	MPW	0.285001382	1660.703052	228	1886.68	0	0	21.7345536	8.667
14ENSUCOMP01	LM	MPW	0.172377896	1004.446	360	1140	121	1.39392	13.1328	8.667
14ENEUR17H01	LM	LPU	0.010105002	58.881848	240	242.67	240.67	1.48445256	1.49678856	8.667
14CNGLOBAL01	LM	LPU	0.090424111	526.901296	228	2239.34	244	1.504992	13.81224912	8.667
14CNGLOBAL01	LM	LPU	0.090424111	526.901296	228	2239.34	244	1.504992	13.81224912	8.667
14NNRCTRLT01	LM	R/T			252					
Total Resources			1.093703147	6373.008238						
Allocation										

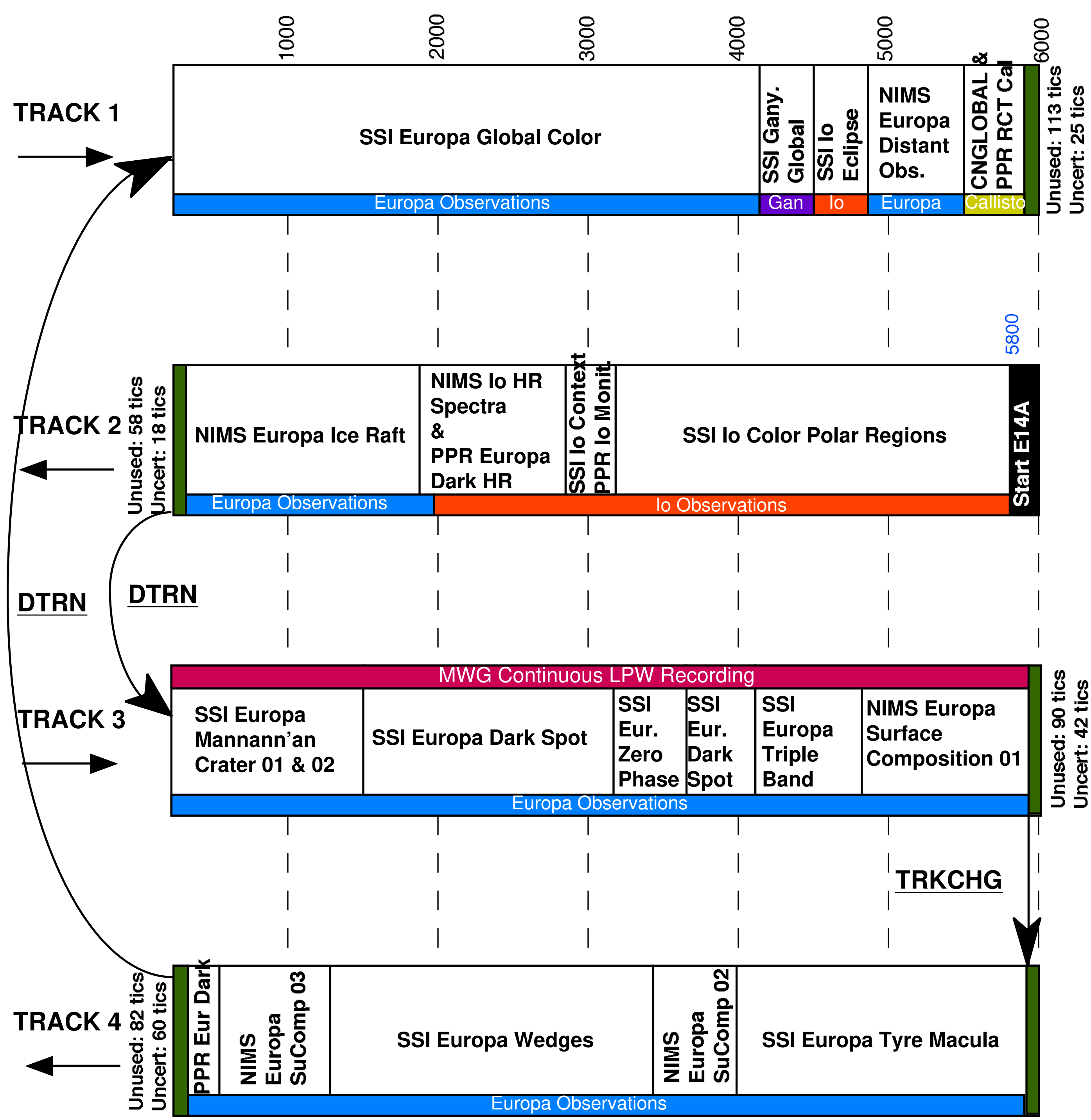
E14 NIMS RESOURCES

Activity ID	AACS Mbits	Thold	Comp	Total MBTG (4% overhead)	Data Reduct Factor (sBOT/BTG)	Pass
14JNJUPRTS01*						
14INHRSPEC01-	0.0277056	2	1.2	3.116760125	1.777846154	1
14ENICERAF01-	0.0069696	0	1.3	0.804153686	1.7334	1
14ENSUCOMP01-	0.026496	0	1.3	3.057113188	1.7334	1
14ENSUCOMP02-	0.000192096		1.3			1
14ENSUCOMP03-	0.0104832	0	1.3	1.209553479	1.7334	1
14ENEUR15H01-	0.016436736	0	1.5	0.767018179	2.294731113	1
14ENEUR15H01-	0.016319808	0	1.5	1.087945356	3.000115385	1
14ENEUR17H01-	0		1.6			
14ENEUR17H01-	0.013862592		1.6			2
14ENEUR20H01-	0		1.6			
14ENEUR20H01-	0.011328192	0	1.6	0.70798477	1.713399231	1
14NNPCTRLT01-		0				
14JNJUPRTS02*		0				
14CNGLOBAL01_A*	0.0499968	2	2	0.156233991	34.26798462	1
14CNGLOBAL01_C*	0.028531008	0	2	1.355170758	2.254472672	1
14NNCHOPOF01-					#DIV/0!	
14CNGLOBAL01_E*	0.048998592	2	2	0.153114711	34.26798462	1
14NNRCTRLT01-		0		0.08		
14INHRSPEC01-	0.0277056	0	1.2	3.116760125	1.777846154	2
14ENICERAF01-	0		1.3			2
14ENSUCOMP01-	0.0069696	0	1.3	0.804153686	1.7334	2
14ENEUR17H01-	0.013862592	0	1.6	0.866378678	1.713399231	2
14CNGLOBAL01_B*	0.0140544	2	2	0.667558325	2.254472672	2
14CNGLOBAL01_D*	0.0140544	2	2	0.667558325	2.254472672	2
14NNRCTRLT01-		0		0.17		
			Delay	2.694		
			Total	21.48145738		
			Alloc	21.369		
			Over/Under	0.112457381		



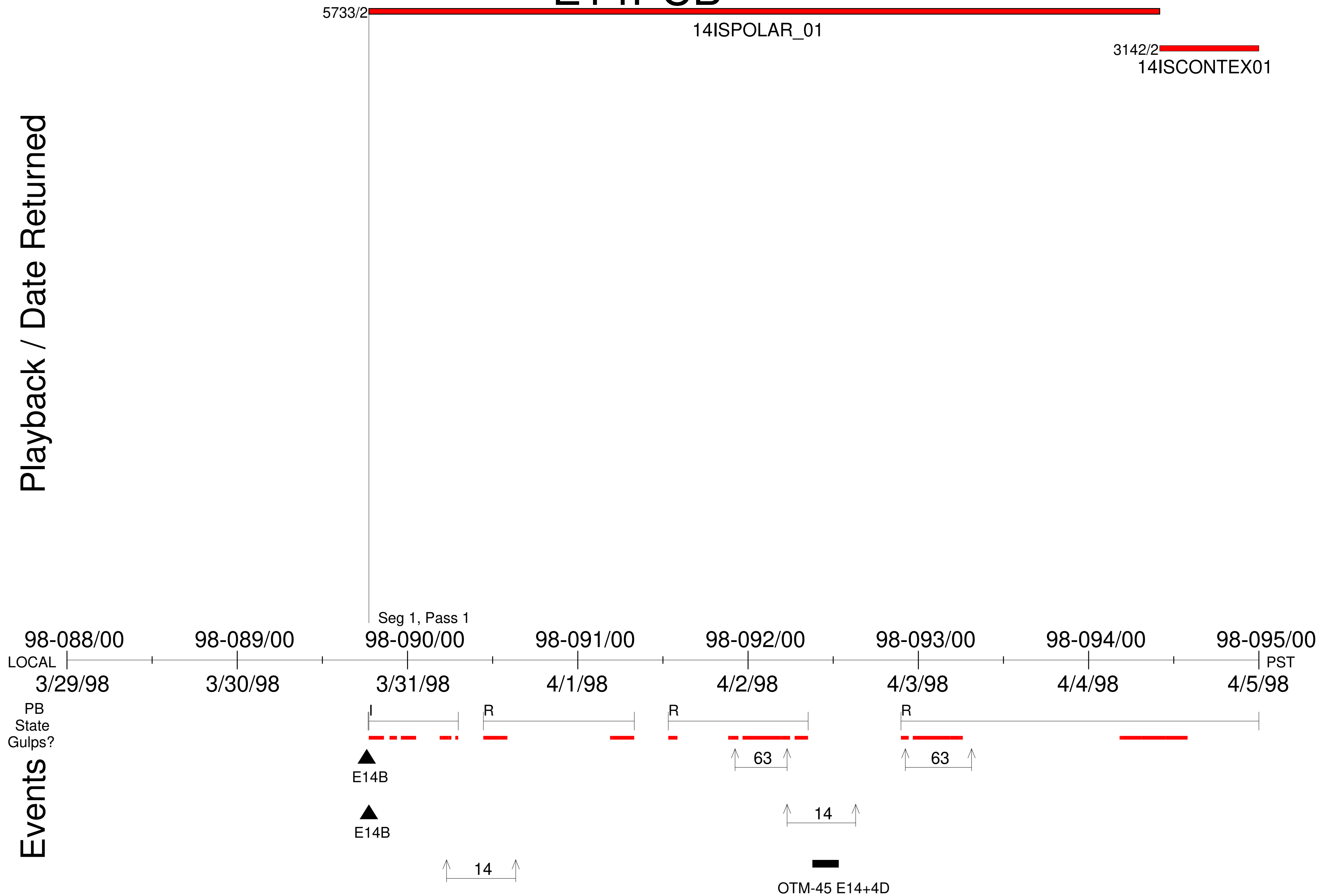
Geometric Events
MWG Observations
RS
UVS/EUV Observations
SSI Observations
PPR Observations
NIMS Observations
E14 ENCOUNTER
Plot Time: 98-087/00:00:00.000 to 98-91/00:00:00.000
Date of Plot: 17-Mar-98 9:13:35
GEM: E14
Target Body:
Europa
Io
Jupiter
Callisto
Ganymede
MWG, Torus, and Engineering Events
All times are SCET
88
89
90
Io
Jupiter
Europa
Ganymede
Callisto
14EBSATCA_01-
14MBSURVEY01-
14ERGRVFLD01
14EUATMOS_01-
14IUATMOS_01-
14IUHRSPEC01+
14EUICERAF01+
14EUSUCOMP01+
14EUSUCOMP02+
14EUSUCOMP03+
14JUAURORA_N-
14TV14MANS01-
14TU14MANS01-
14CUGLOBAL01+
14ISPOLAR_01
14ISCONTEX01
14ESCRATER01
14ESCRATER02
14ESDRKSPT01
14ESTYREPD01
14ESDRKSPT02
14ESTYREHR01
14ESWEDGES01
14ESGLOCOL01
14GSGLOBAL01
14ISECLIPS01
14IPIOMON_01
14EPDARKHR01
14EPDGTMHR01
14EPDRKMAP01
14NPRCTCAL01*
14NNJUPRTS01-
14JNJUPRTS01*
14NNHRSPEC01-
14INHRSPEC01-
14NNICERAF01-
14ENICERAF01-
14NNSUCOMP01-
14ENSUCOMP01-
14NNSUCOMP02-
14ENSUCOMP02-
14NNSUCOMP03-
14ENSUCOMP03-
14NNEUR15H01-
14ENEUR15H01-
14NNEUR17H01-
14ENEUR17H01-
14NNEUR20H01-
14ENEUR20H01-
14NNJUPRTS02-
14JNJUPRTS02*
14NNGLOBAL01-
14CNGLOBAL01*
14NNCHOPOF01-

E14 HIGH-LEVEL TAPEMAP



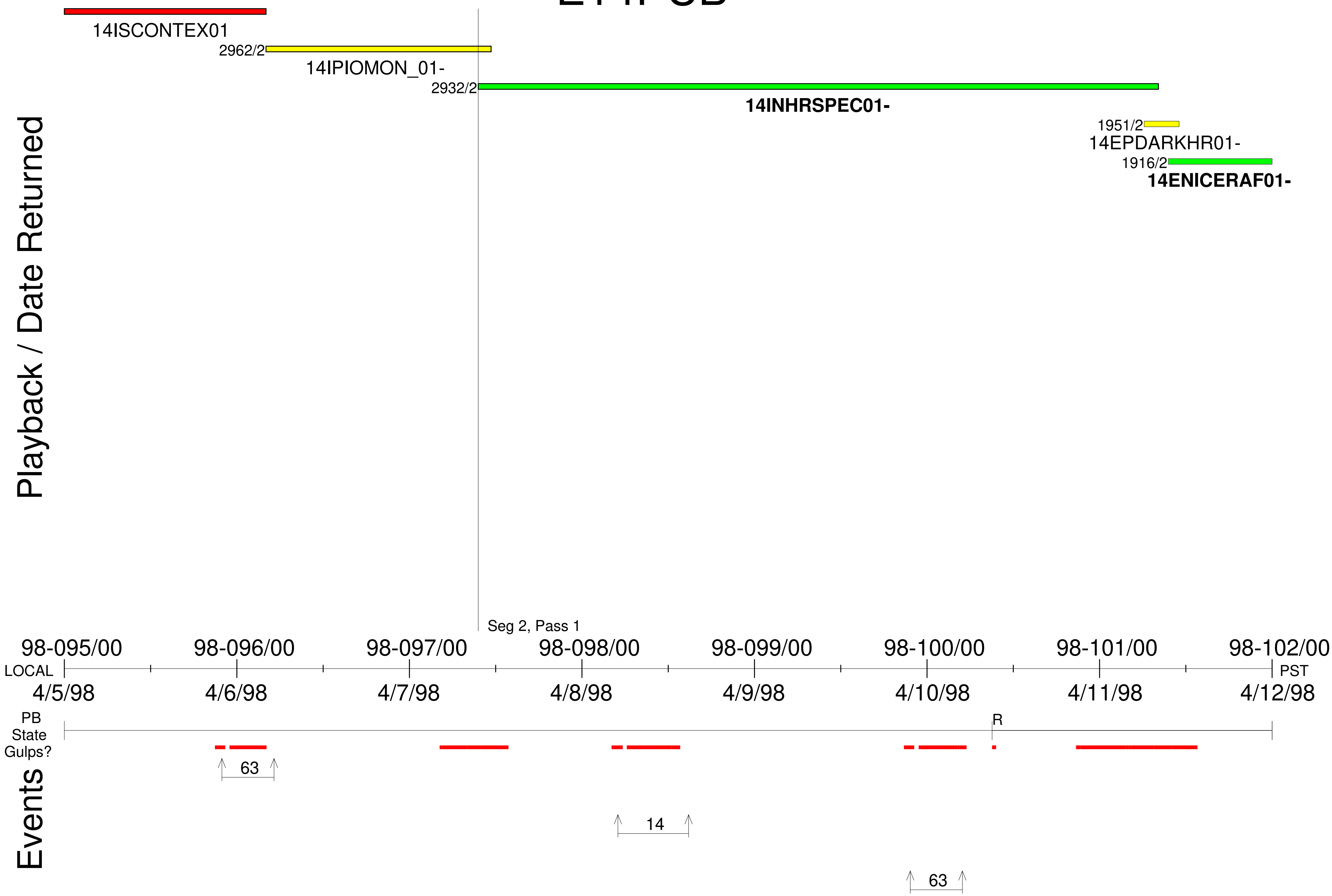
J. Gross, 03/04/98

E14PCB



5733/2
14ISPOLAR_01
3142/2
14ISCONTEX01
Playback / Date Returned
Seg 1, Pass 1
98-088/00
98-089/00
98-090/00
98-091/00
98-092/00
98-093/00
98-094/00
98-095/00
LOCAL
PST
3/29/98
3/30/98
3/31/98
4/1/98
4/2/98
4/3/98
4/4/98
4/5/98
PB
State
Gulps?
I
R
R
R
63
63
14
14
E14B
E14B
OTM-45 E14+4D
Events

E14PCB



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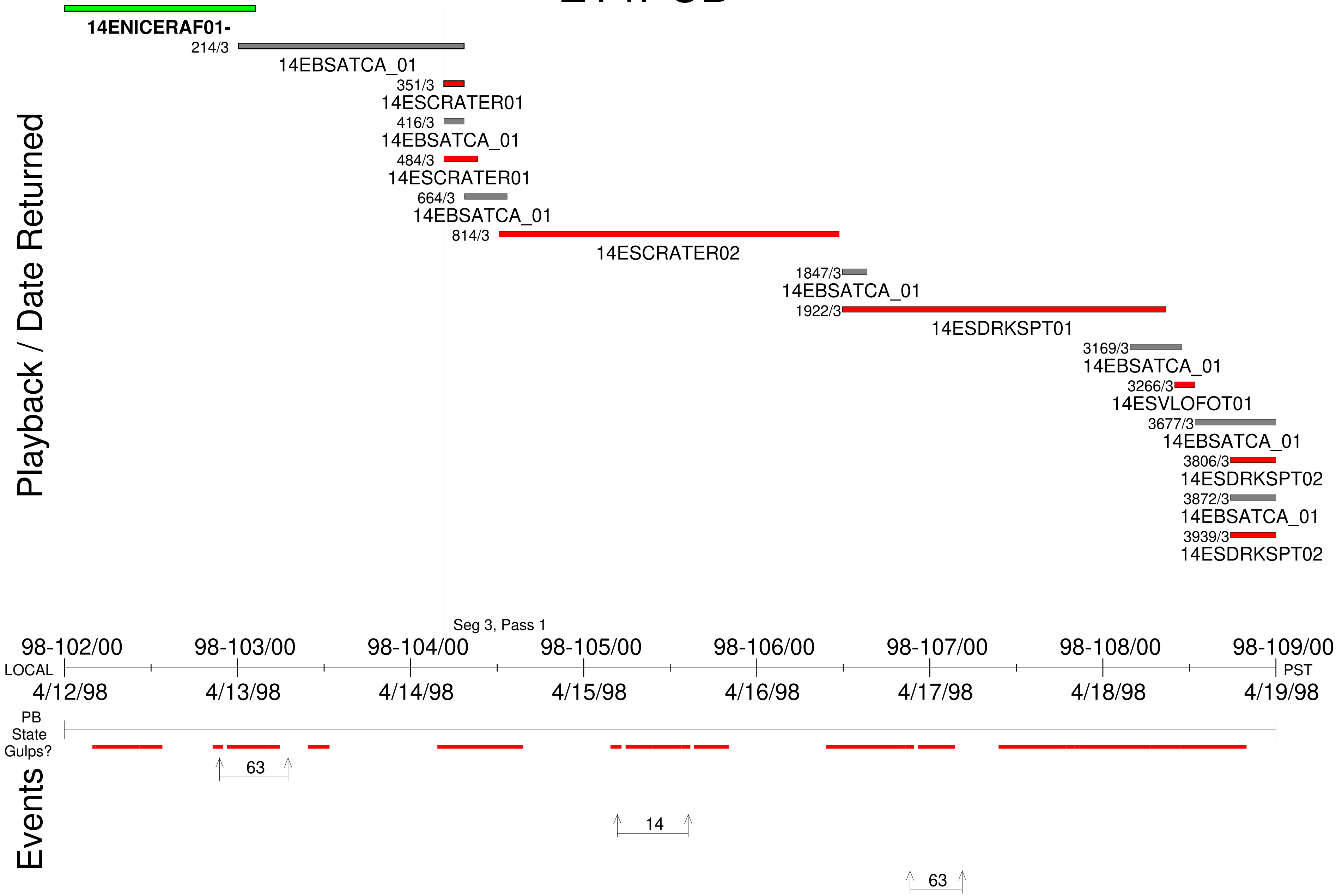

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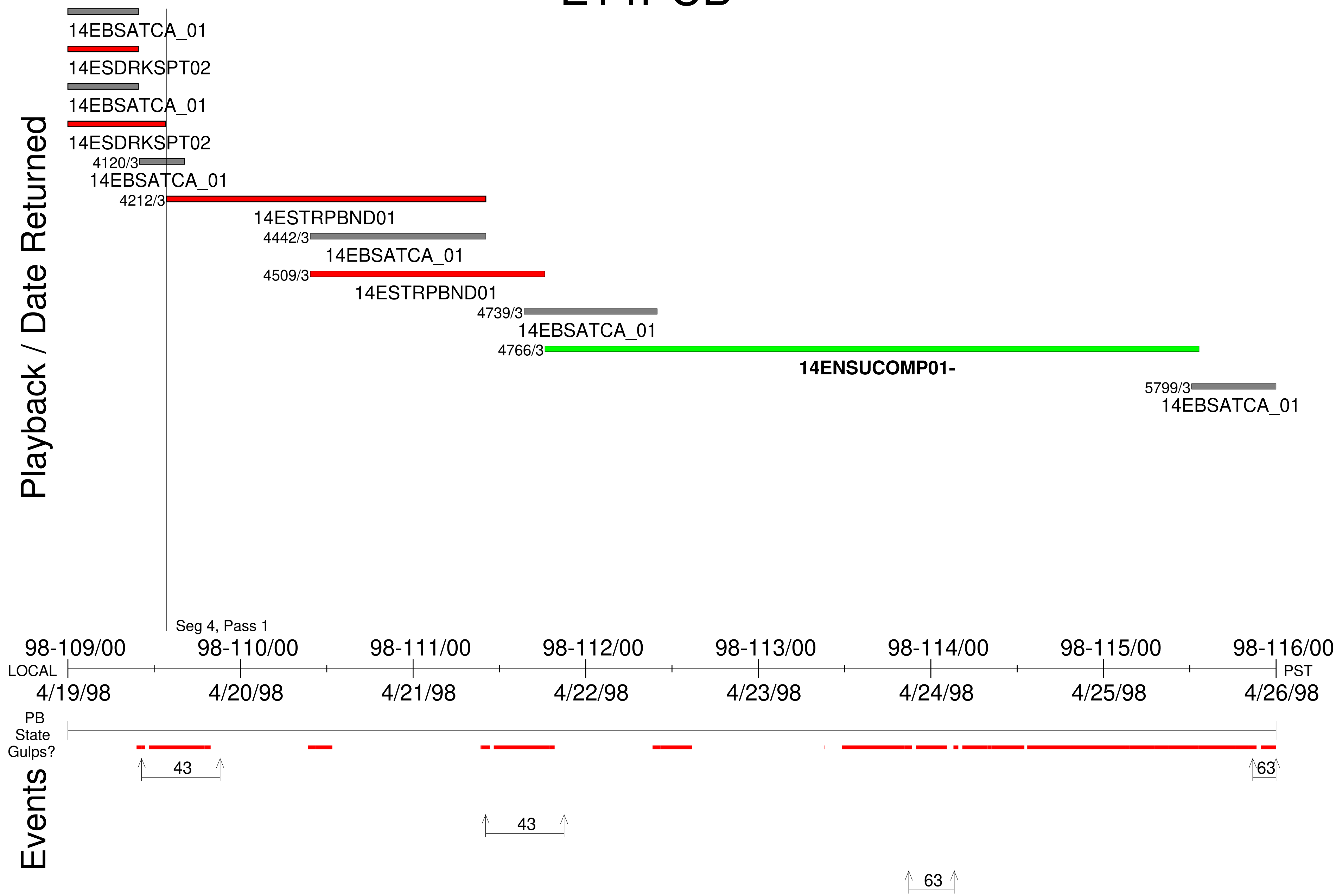

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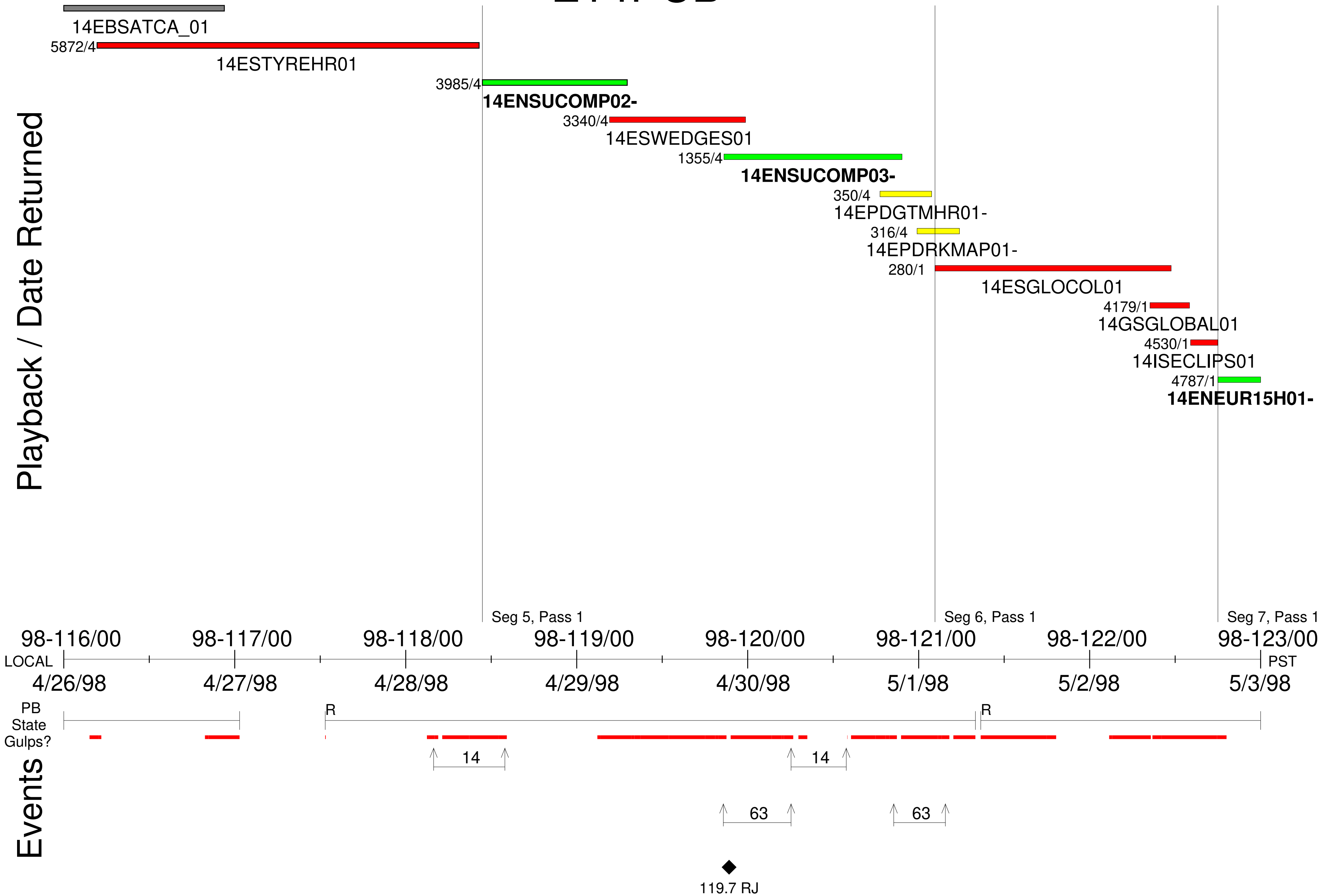

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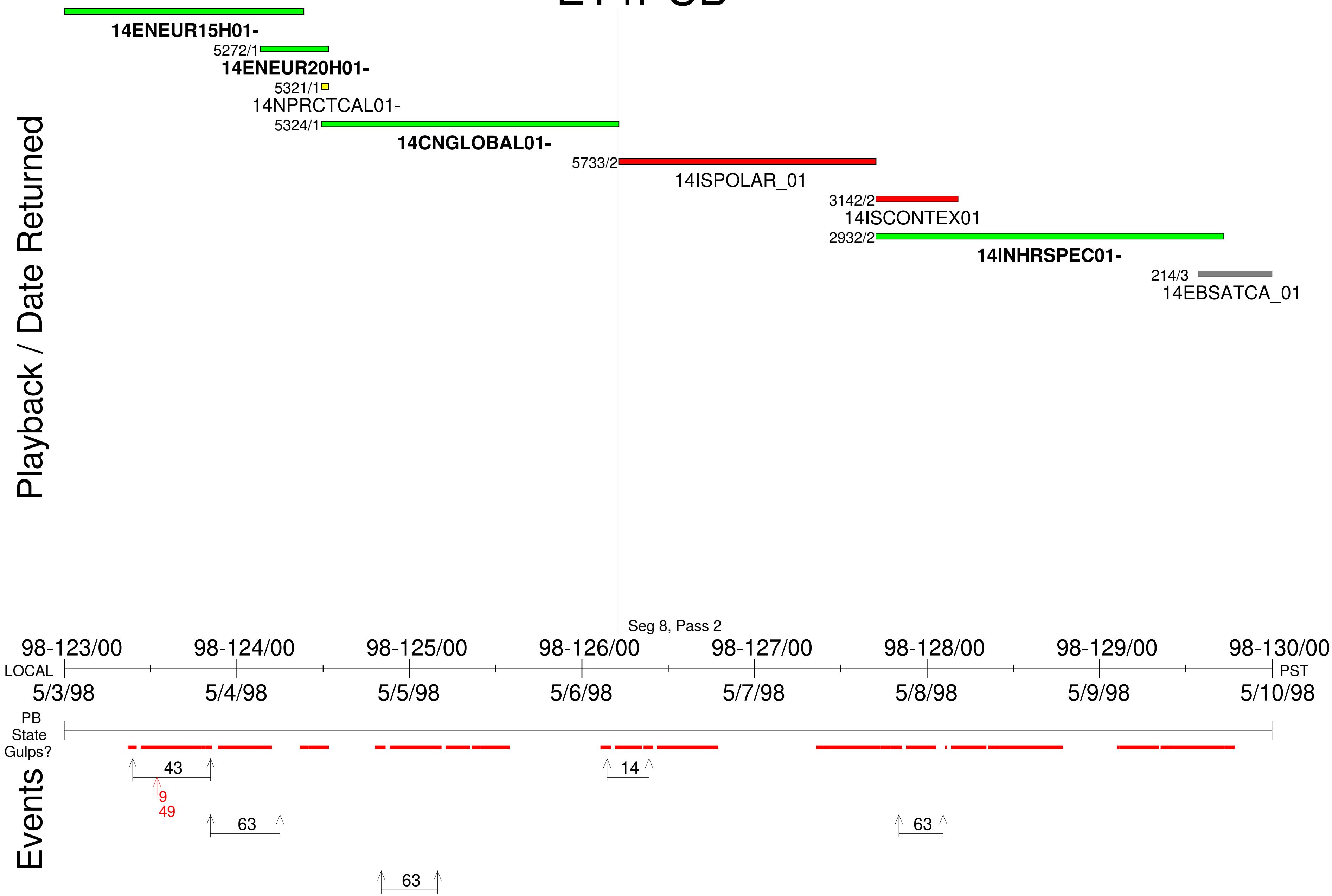
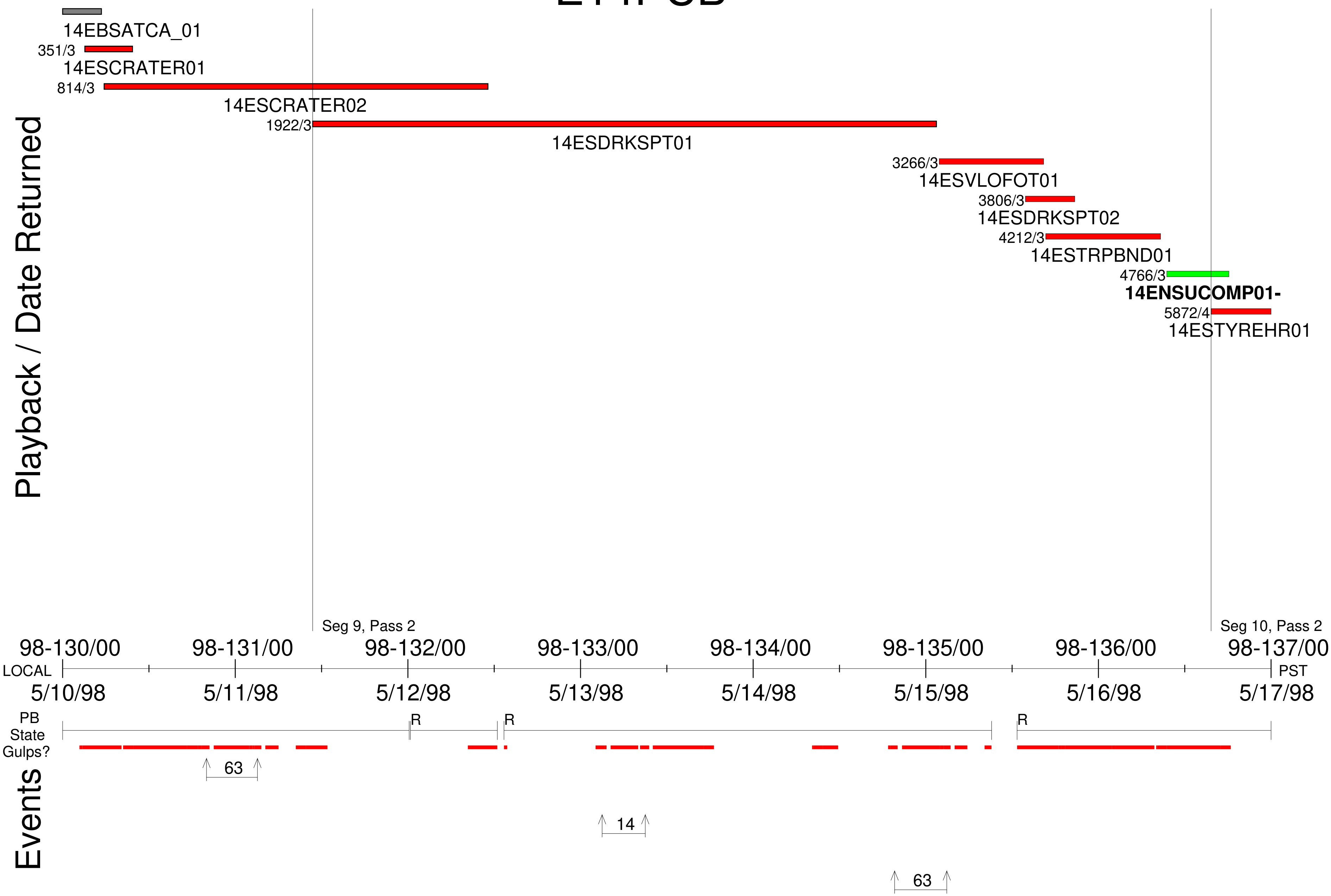


Playback / Date Returned
14ENEUR15H01-
5272/1
14ENEUR20H01-
5321/1
14NPRCTCAL01-
5324/1
14CNGLOBAL01-
5733/2
14ISPOLAR_01
3142/2
14ISCONTEX01
2932/2
14INHRSPEC01-
214/3
14EBSATCA_01
Seg 8, Pass 2
98-123/00
98-124/00
98-125/00
98-126/00
98-127/00
98-128/00
98-129/00
98-130/00
LOCAL
PST
5/3/98
5/4/98
5/5/98
5/6/98
5/7/98
5/8/98
5/9/98
5/10/98
PB
State
Gulps?
Events
43
9
49
63
14
63
63

E14PCB



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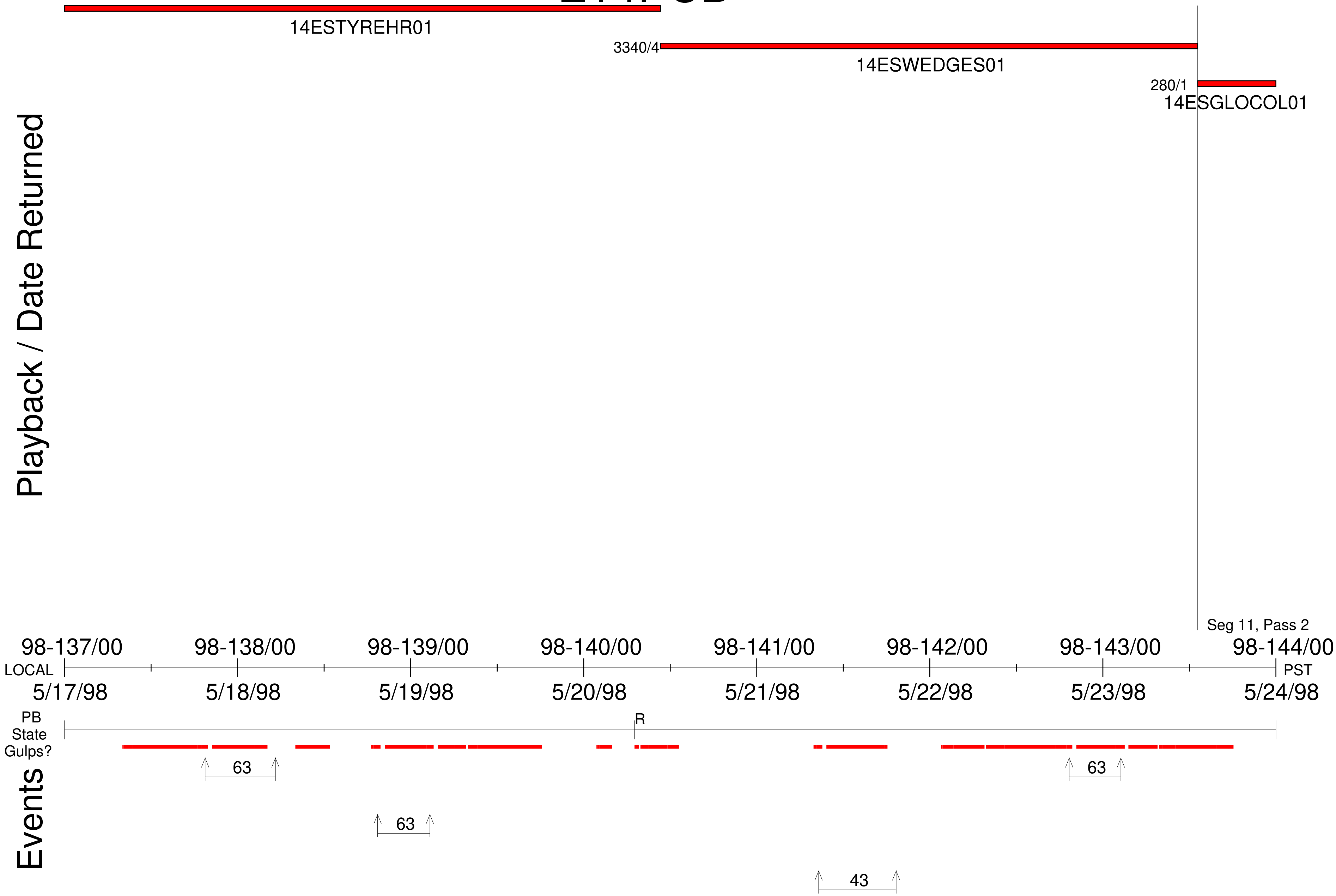
E14PCB



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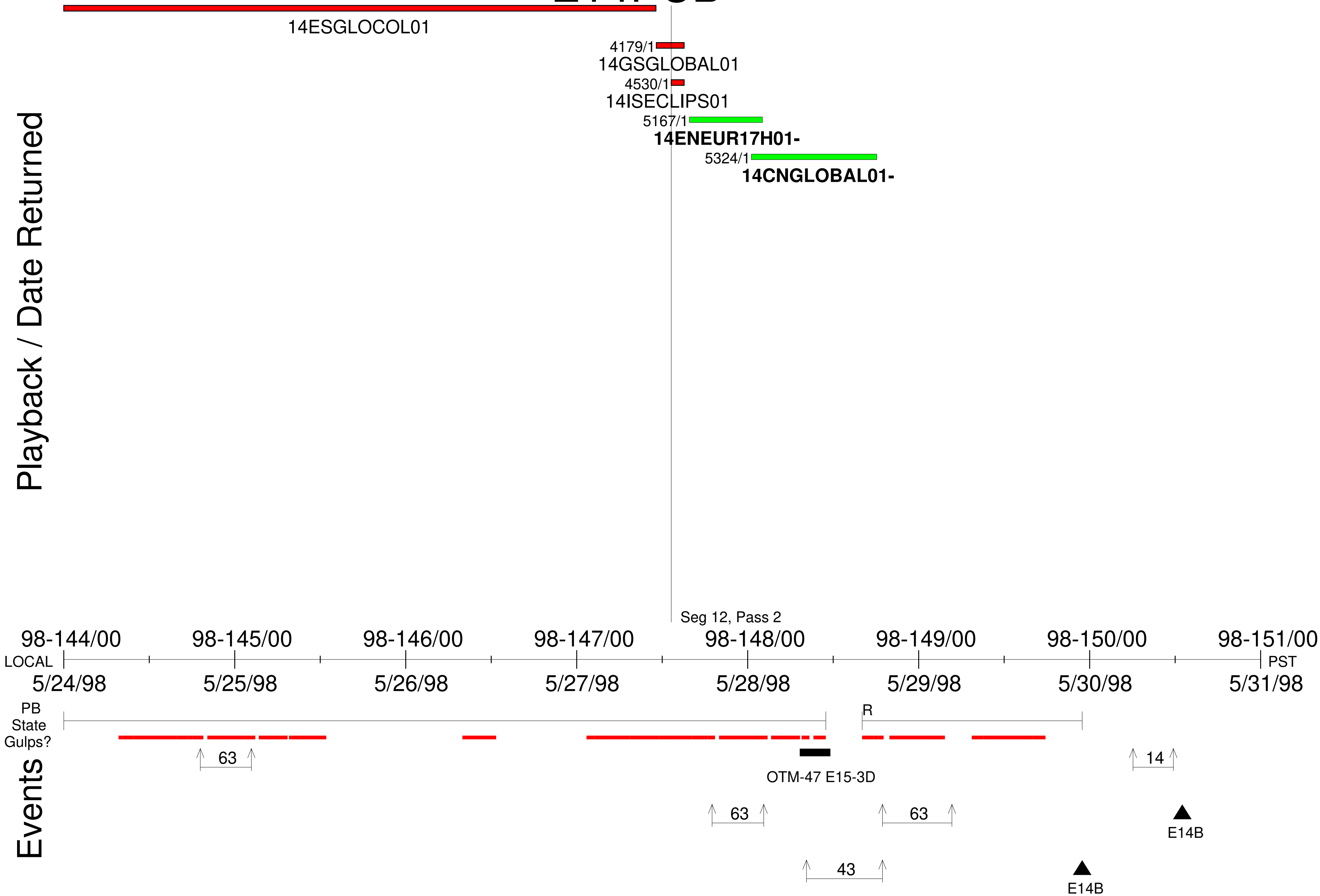
E14PCB



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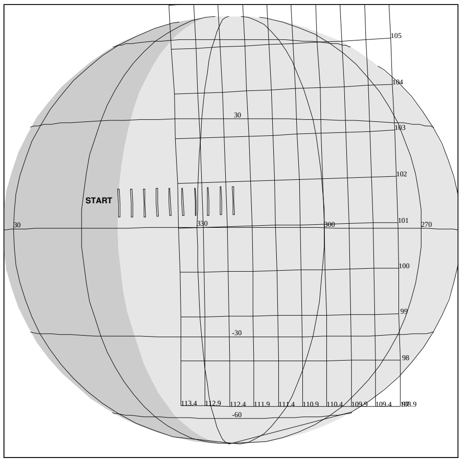

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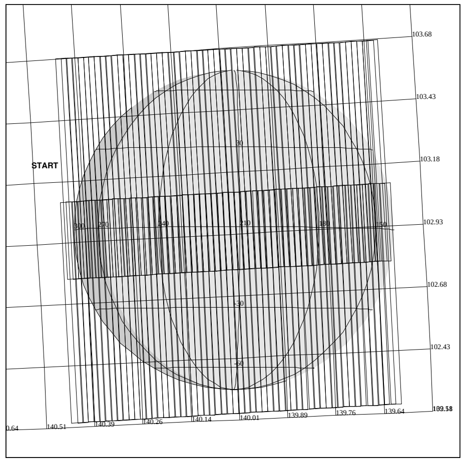

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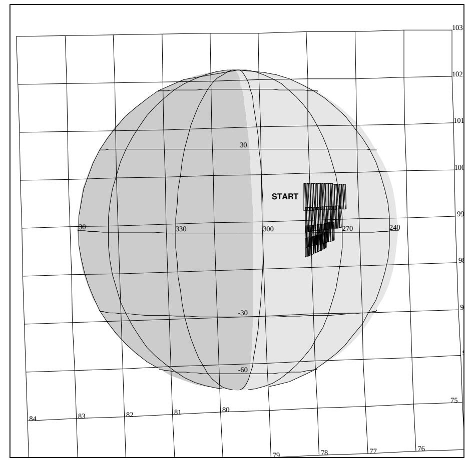

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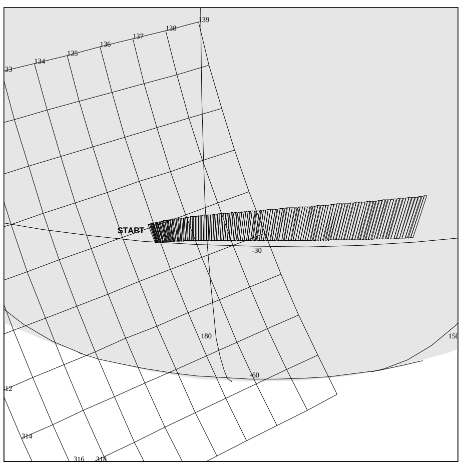

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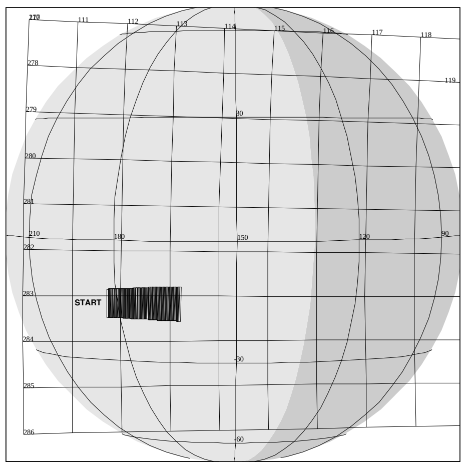

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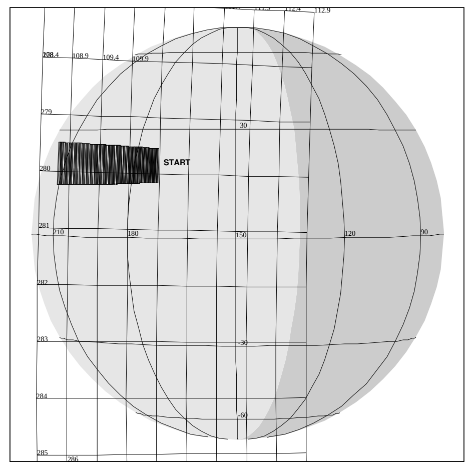

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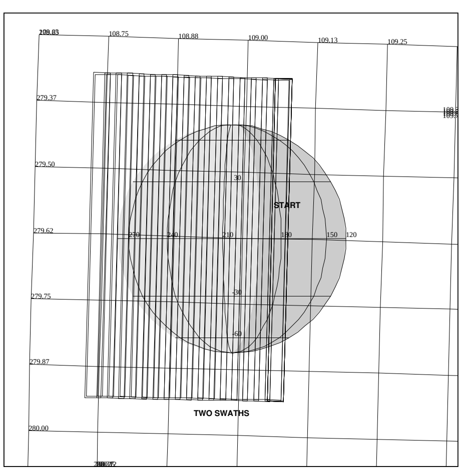

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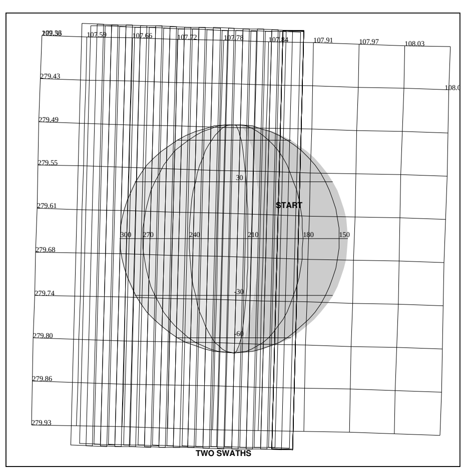

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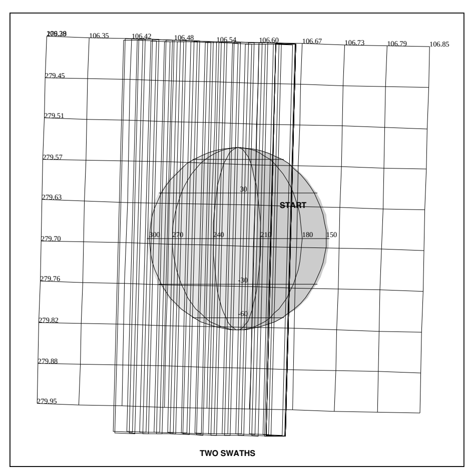

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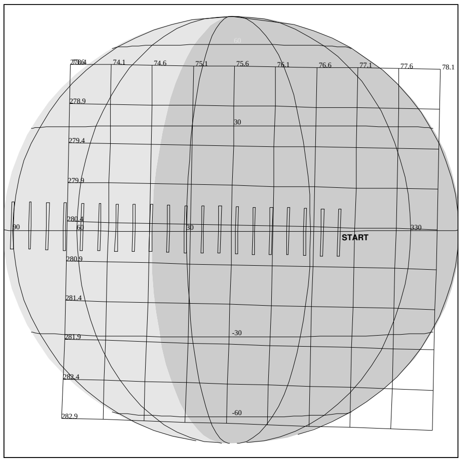

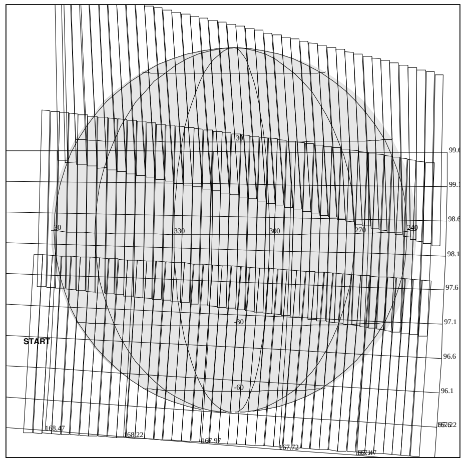

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