Chapter 2 - Orbit Overview

Contents

Introduction to Chapter 2

This chapter gives an overview of the NIMS observations in the I31 Orbit.

The text on page 3 summarizes the NIMS science objectives for I31. The NIMS calibrations are discussed on page 3. Early data return and I31 playback are also discussed on page 3.

The table on page 4 is a time-ordered listing of the NIMS Oapels for I31.

The plot on page 5 shows the geometry of the NIMS I31 observations using a north trajectory pole view projection. The plot on page 6 shows the geometry of the NIMS I31 observations during the Io Flyby using a north trajectory pole view projection. The plot on page 7 shows the geometry of the NIMS I31 calibrations.

The spreadsheet on page 8 summarizes the various inputs for the NIMS I31 Observations. The spreadsheet on pages 9 and 10 summarizes the resource usage for the NIMS I31 observations.

The table on page 11 lists various NIMS I31 observing parameters: target latitude/longitude, range, cone angle, incidence angle light), emission angle view) and phase angle.

The timeline on pages 12 through 16 shows the placement of the I31 observations for all intruments during the I31 Encounter Period.

The tapemap on page 17 shows the placement of the I31 observations on the spacecraft's tape recorder.

The timeline on pages 18 through 27 shows the preliminary I31 playback schedule.

The NIMS I31 mosaic designs are summarized on pages 28 and 29 in time-order.

NIMS I31 SCIENCE OVERVIEW

Jupiter Science

There are two Jupiter observations in I31, both recorded. These two observations look at the Great Red Spot region (GRSPOT). Search for high altitude amonia clouds in the turbulent wake region.

Io Science

The I31 Io sequence design is similar to that used in I27 in response to the loss of spectral capability due to the stuck grating. The NIMS observations are mostly mapping instead of sit-and-stare spectrum building observations. NIMS and SSI did collaborate on some targets, and some ride-along behind SSI will be returned.

31INTHRMAL01 - nightside swath across the Pele vent region.
31INHSISUM01 - high resolution nightside obs. of Isum.
31INSO2MAP01 - high resolution dayside search for SO2 frost.
31INTVASHT01 - dayside swath across the Tvashtar complex.
31INGISHBR01 - dayside two-swath map of Gishbar region.
31INAMRANI01 - dayside three-swath map of Amirani region.
31INREGION01 - dayside seven-swath regional map, pole to pole.
31INREGION02 - dayside three-swath global map, pole to pole.

Europa Science

There are no Europa observations in I31.

Ganymede Science

There are no Ganymede observations in I31.

Callisto Science

There are no Callisto observations in I31.

Calibration

There is one NIMS calibration observation planned for I31: an RCT cal.

Early Data Return

There is one realtime observations in I31, the RCT calibration.

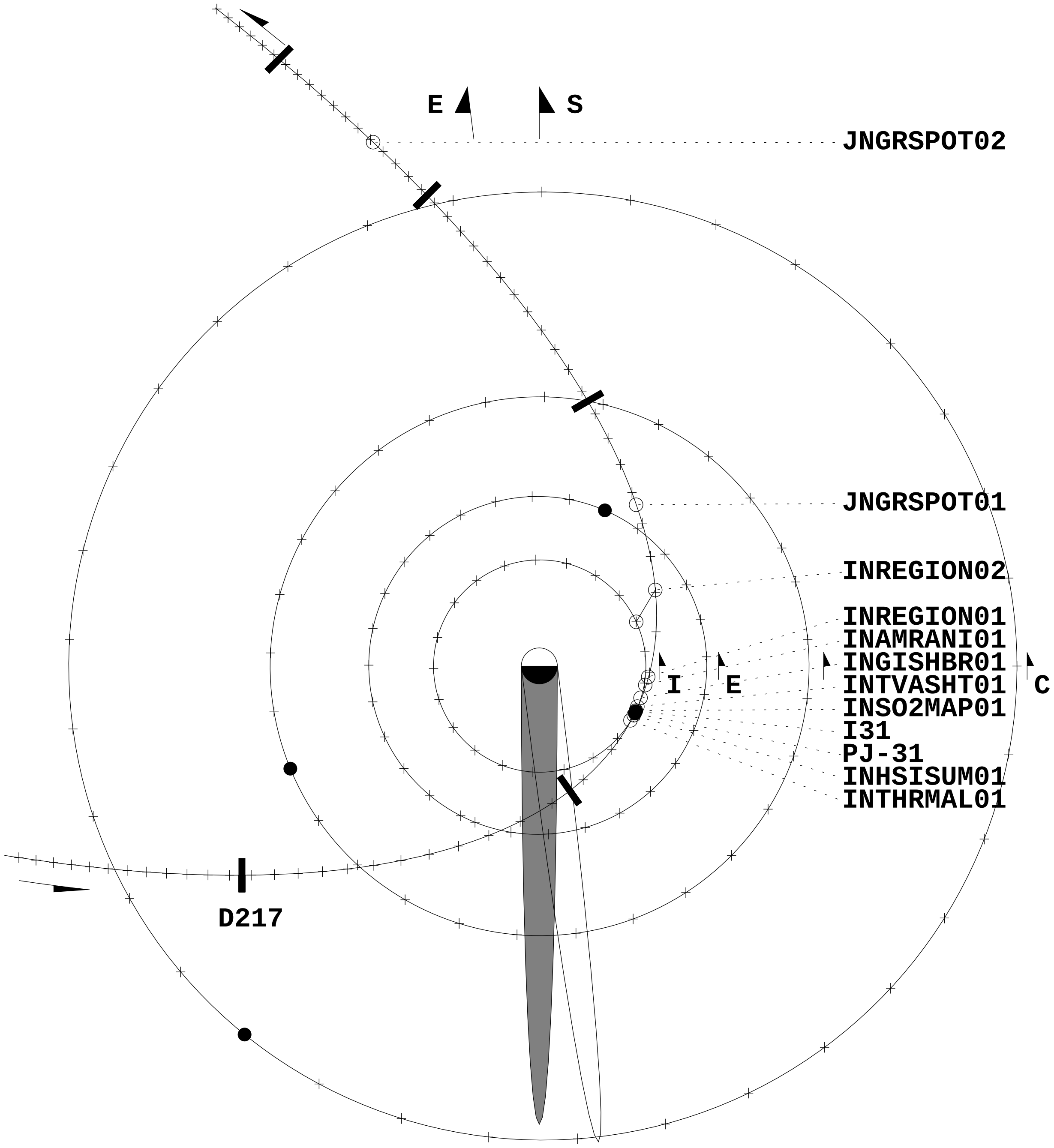
I31 Playback

I31 playback is split into two passes through the tape.

I31 Time-Ordered Listing

OAPEL	Start (UTC)	End (UTC)	Duration
31INTHRMAL01	01-218/04:33:31	01-218/04:47:40	0/00:14:09
31INHSISUM01	01-218/04:47:40	01-218/04:53:44	0/00:06:04
31INSO2MAP01	01-218/05:01:50	01-218/05:07:54	0/00:06:04
31INTVASHT01	01-218/05:13:58	01-218/05:25:05	0/00:11:07
31INGISHBR01	01-218/05:39:14	01-218/05:59:28	0/00:20:13
31INAMRANI01	01-218/06:19:41	01-218/06:36:52	0/00:17:11
31INREGION01	01-218/06:50:01	01-218/07:24:24	0/00:34:22
31INREGION02	01-218/07:24:24	01-218/07:58:46	0/00:34:22
31JNGRSPOT01	01-218/16:09:10	01-218/16:53:39	0/00:44:29
31JNGRSPOT02	01-220/08:31:47	01-220/09:16:16	0/00:44:29
31NNRCTRLT01	01-238/22:00:29	01-239/11:02:57	0/12:02:28

NIMS I31 OBSERVATIONS



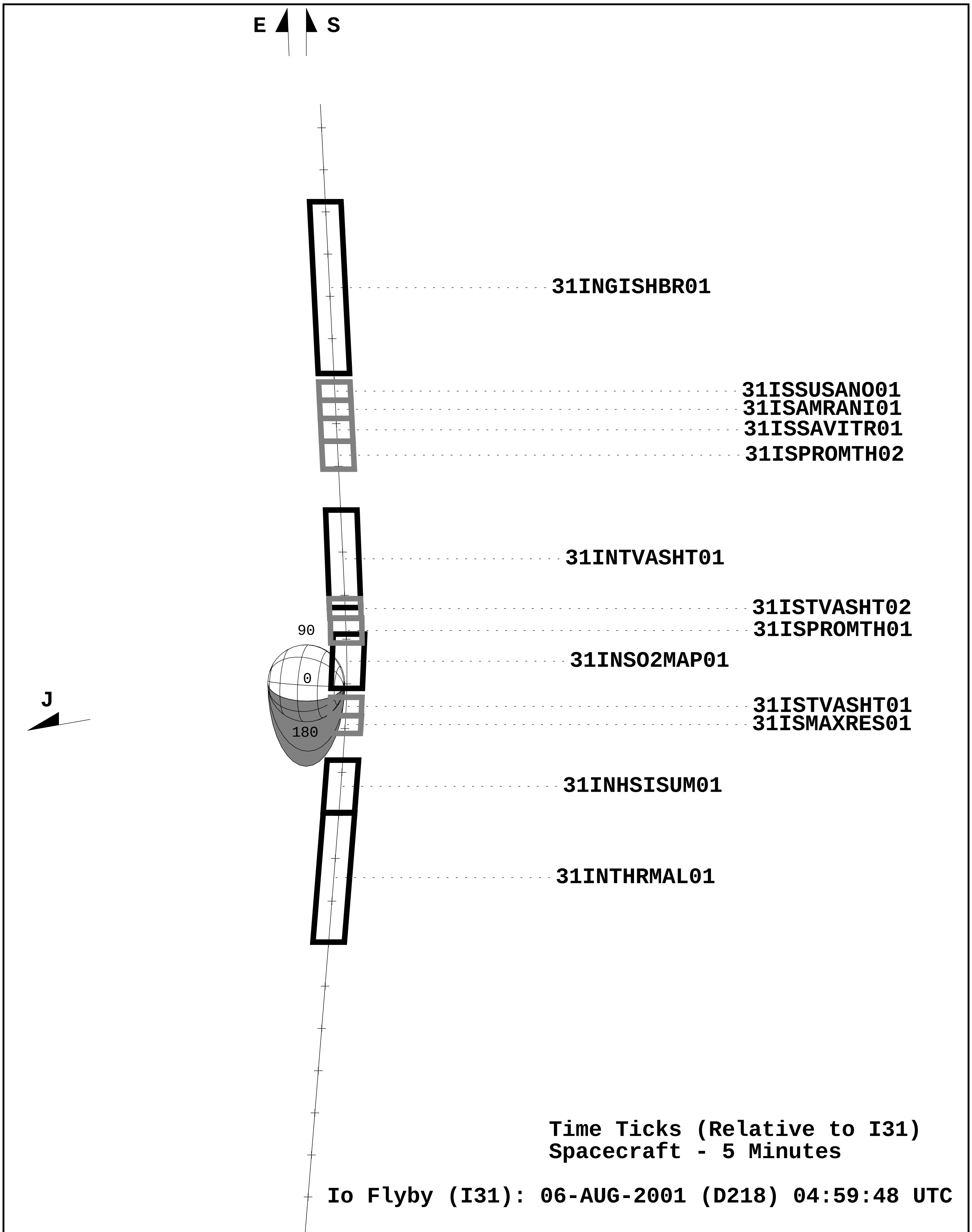
Time Ticks (Relative to PJ31)
Io - 2 Hrs
Europa - 3 Hrs
Ganymede - 6 Hrs
Callisto - 12 Hrs
Spacecraft - 2 Hrs

Io Flyby (I31): 06-AUG-2001 (D218) 05:00:21 UTC
Perijove (PJ31): 06-AUG-2001 (D218) 04:53:14 UTC

I31 North Trajectory Pole View

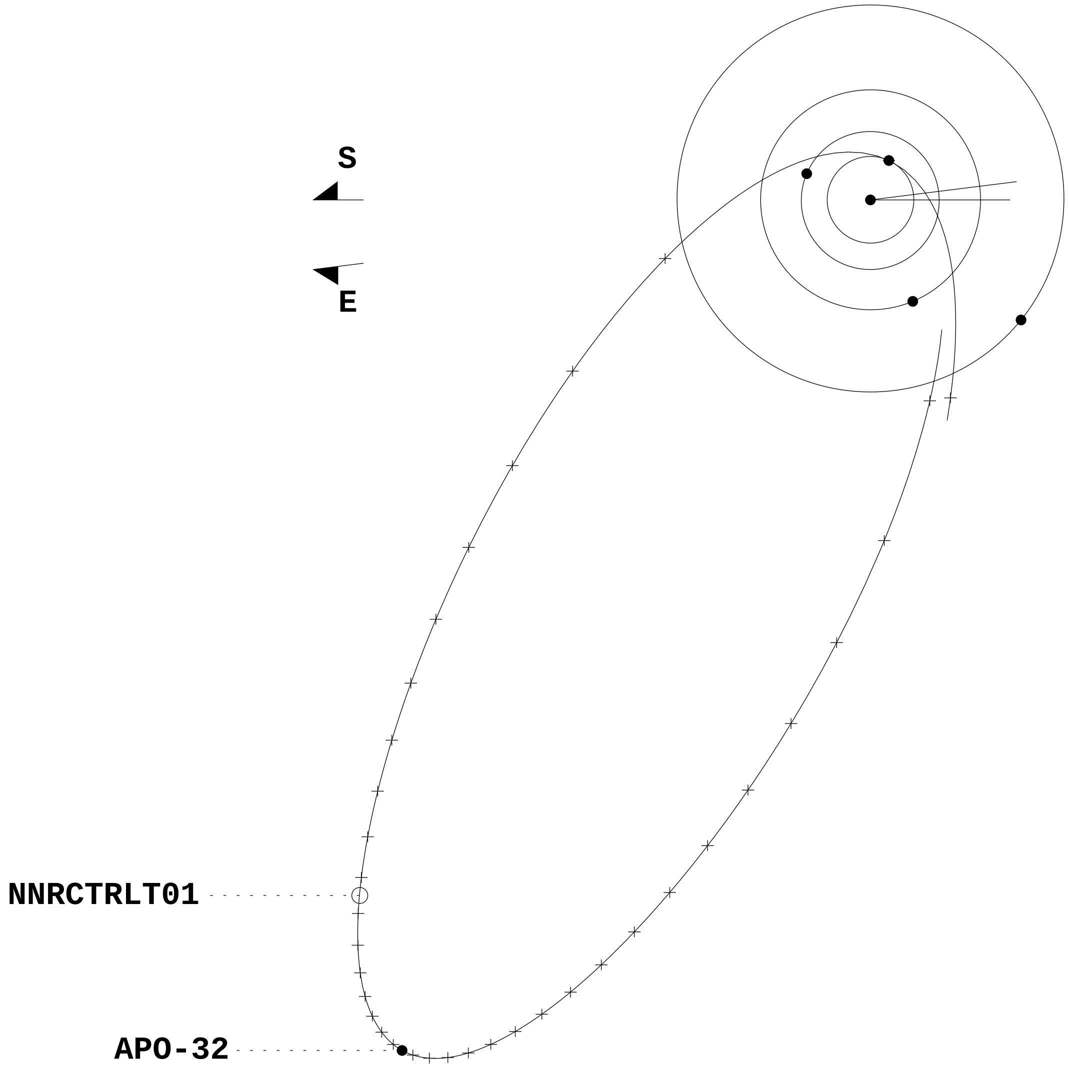
NIMS - FEL - 07/05/01

NIMS & SSI I31 IO FLYBY OBSERVATIONS



I31 North Trajectory Pole View, +/- 1 Hour NIMS - FEL - 05/24/01

NIMS I31 CALIBRATIONS



Time Ticks (Relative to I31)
Spacecraft - 2 Days

Io Flyby (I31): 06-AUG-2001 (D218) 05:00:21 UTC
Perijove (PJ31): 06-AUG-2001 (D218) 04:53:14 UTC
Apojove (A32): 10-SEP-2001 (D253) 14:54:07 UTC

I31 North Trajectory Pole View

NIMS - FEL - 10/31/01

I31 NIMS INPUTS

Activity ID	Observation Title	NIMS Edit Table	NIMS PB Table	Mode	Gain	Grating Start	Grating Offset	Record Format	PSID
31INTHERML01	Io Thermal Map	I31ILM442	I31ILM144	LM	1	0	4	MPW	DA
31INHSISUM01	Io Isum Obs	I31ILM442	I31ILM144	LM	1	0	4	MPW	DB
31INSO2MAP01	Io SO2 Map	I31ILM442	I31ILMFG96	LM	2	0	4	MPW	DC
31INTVASHT03+	Io Tvashtar SSI ride-along	I31ILM442	I31ILMFG96	LM	2	0	4	IM8	IC
31INTVASHT01	Io Tvashtar region	I31ILM442	I31ILM144	LM	2	0	4	MPW	DD
31INGISHBR01	Io Gishbar Mosaic	I31ILM442	I31ILM144	LM	2	0	4	MPW	DE
31INAMRANI01	Io Amirani Mosaic	I31ILM442	I31ILMFG36	LM	2	0	4	MPW	DF
31INREGION01	Io Regional Map	I31ILMFG252	I31ILMFG36B	LM	2	0	4	LPU	DG
31INREGION02	Io Regional Map	I31ILMFG252	I31ILMFG36B	LM	2	0	4	LPU	DH
31JNGRSPOT01	Jupiter Great Red Spot	I31JSMFG60	I31JSMFG54	SM	2	0	4	LPU	DK
31JNGRSPOT02	Jupiter Great Red Spot	I31JLMFG240	I31JLMFG54	LM	2	0	4	LPU	DL

I31 RESOURCES

Activity ID	Mode	Record Format	Obs. Cost (tracks)	Obs. Cost (ticks)	Number Wavelengths Returned	Obs Record Time (sec.)	Observation PB Time (sec.)	Selected Bits to Tape sBOT (MBITS)	Bits to Tape BOT (Mbit)	Mode Cycle time (sec)
31INTHERML01	LM	MPW	0.0915	533	144	604	600	6.91	6.96	8.667
31INHSISUM01	LM	MPW	0.0368	214	144	241	236	2.72	2.78	8.667
31INSO2MAP01	LM	MPW	0.0458	267	96	301	40	0.46	3.47	8.667
31INTVASHT03+	LM	MPW			96	50	44	0.51	0.58	8.667
31INTVASHT01	LM	MPW	0.0899	526	144	596	593	6.83	6.87	8.667
31INGISHBR01	LM	MPW	0.0758	852	144	967	500	5.76	11.14	8.667
31INAMRANI01	LM	MPW	0.1372	811	36	920	907	10.45	10.60	8.667
31INREGION01	LM	LPU	0.2772	1716	36	7311	6882	42.45	45.09	8.667
31INREGION02	LM	LPU	0.0166	1026	36	4370	404	2.49	26.95	8.667
31JNGRSPOT01	SM	LPU	0.0687	588	54	2500	1700	10.49	15.42	2.33
31JNGRSPOT02	LM	LPU	0.1062	623	54	2650	2632	16.23	16.35	8.667

I31 RESOURCES

Activity ID	AACS Mbits c 2.5	Comp	Thold	RT BTG	Total BTG (Mbits) (w/ 4% O'head)	Data Reduct. Factor (sBOT/BTG)	Pass
31INTHERML01	0.03	1.33			1.56	4.43	2
31INHSISUM01	0.01	1.36			0.60	4.53	2
31INSO2MAP01	0.00	1.35			0.07	6.75	2
31INTVASHT03+	0.00	1.31			0.08	6.55	2
31INTVASHT01	0.03	1.12			1.83	3.73	2
31INGISHBR01	0.03	1.18			1.46	3.93	2
31INAMRANI01	0.05	1.16			0.68	15.47	2
31INREGION01	0.40	1.16			5.13	8.28	2
31INREGION02	0.02	1.27			0.27	9.07	2
31JNGRSPOT01	0.10	1.42			5.77	1.82	2
31JNGRSPOT02	0.15	1.74			1.96	8.28	2

NIMS I31 OBSERVING GEOMETRY

OAPEL	Latitude (deg)	Longitude (deg)	Range (km)	Cone (deg)	Light (deg)	View (deg)	Phase (deg)
31INTHRMAL01	-18 to -16	253 to 258	4 to 8K	38 to 50	160	40 to 57	312 to 146
31INHSISUM01	32 to 34	203 to 207	2 to 4K	51 to 66	129	73 to 82	118 to 134
31INTVASHT02	60 to 64	119 to 125	310 to 522	97 to 131	70 to 75	12 to 28	46 to 82
31INSO2MAP01	70	100	1K	128	83	71	47
31INTVASHT03	60 to 64	112 to 126	5K	147	67 to 75	63 to 69	27
31INTVASHT01	58 to 66	118 to 130	6 to 10K	148	70 to 76	67 to 71	27
31INAMRANI02	17 to 33	112 to 121	14K	149	47 to 54	27 to 35	26
31INGISHBR01	12 to 21	84 to 94	15 to 21K	146	16 to 26	16 to 25	29
31INAMRANI01	12 to 40	109 to 126	31 to 37K	148	38 to 51	23 to 40	27
31INREGION01	-90 to +90	80 to 172	44 to 92K	146	7 to 86	2 to 90	27
31INREGION02	-90 to +90	69 to 251	145 to 174K	139	2 to 124	3 to 90	34
31JNGRSPOT01	-28 to -8	82 to 156	716K	145	13 to 65	10 to 67	27 to 33
31JNGRSPOT02	-32 to +8	64 to 151	2148K	167	5 to 80	1 to 63	16 to 19

I31 ENCOUNTER
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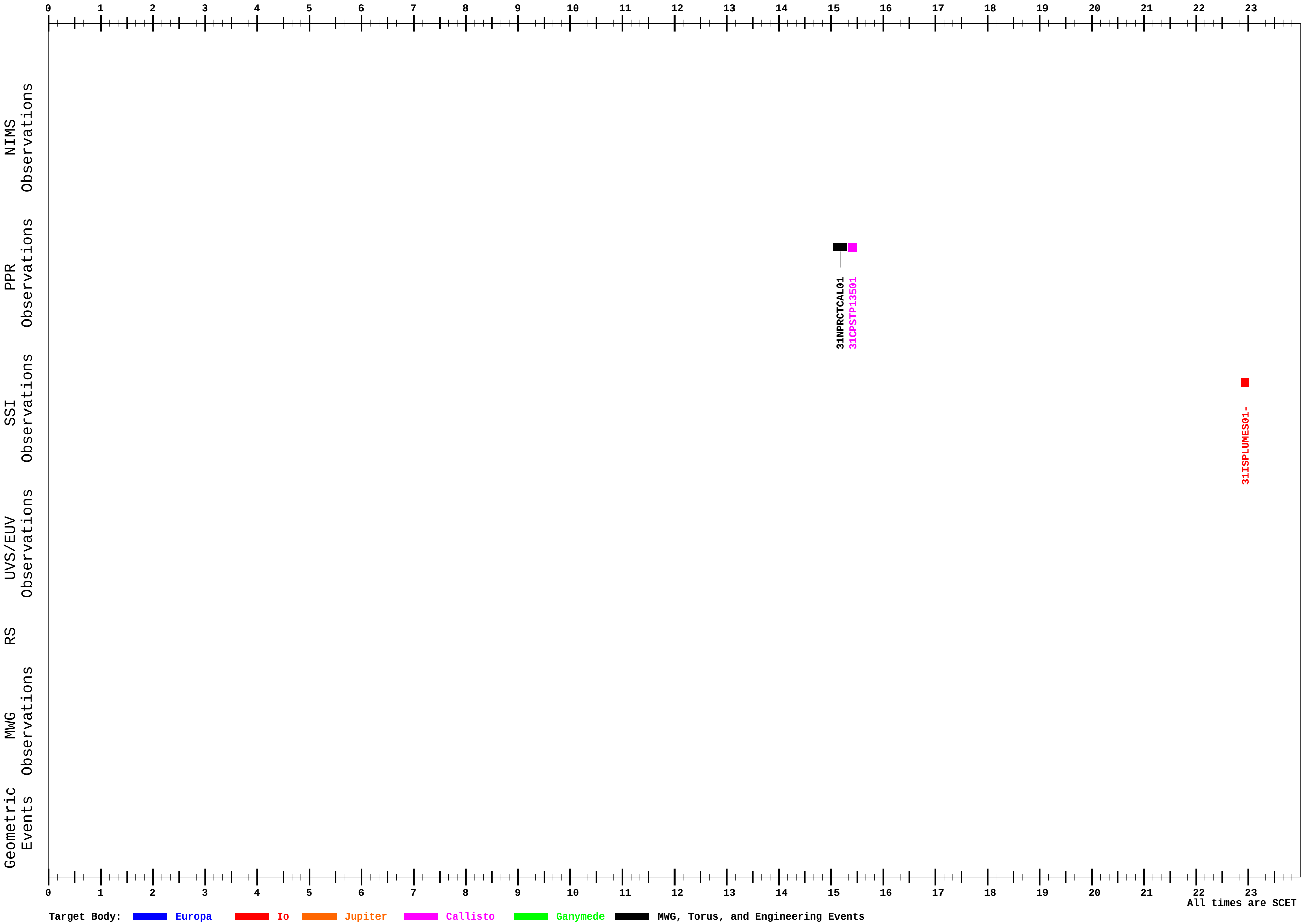
Date of Plot: 18-Jul-101 13: 1:57

GEM: I31



GEM: I31

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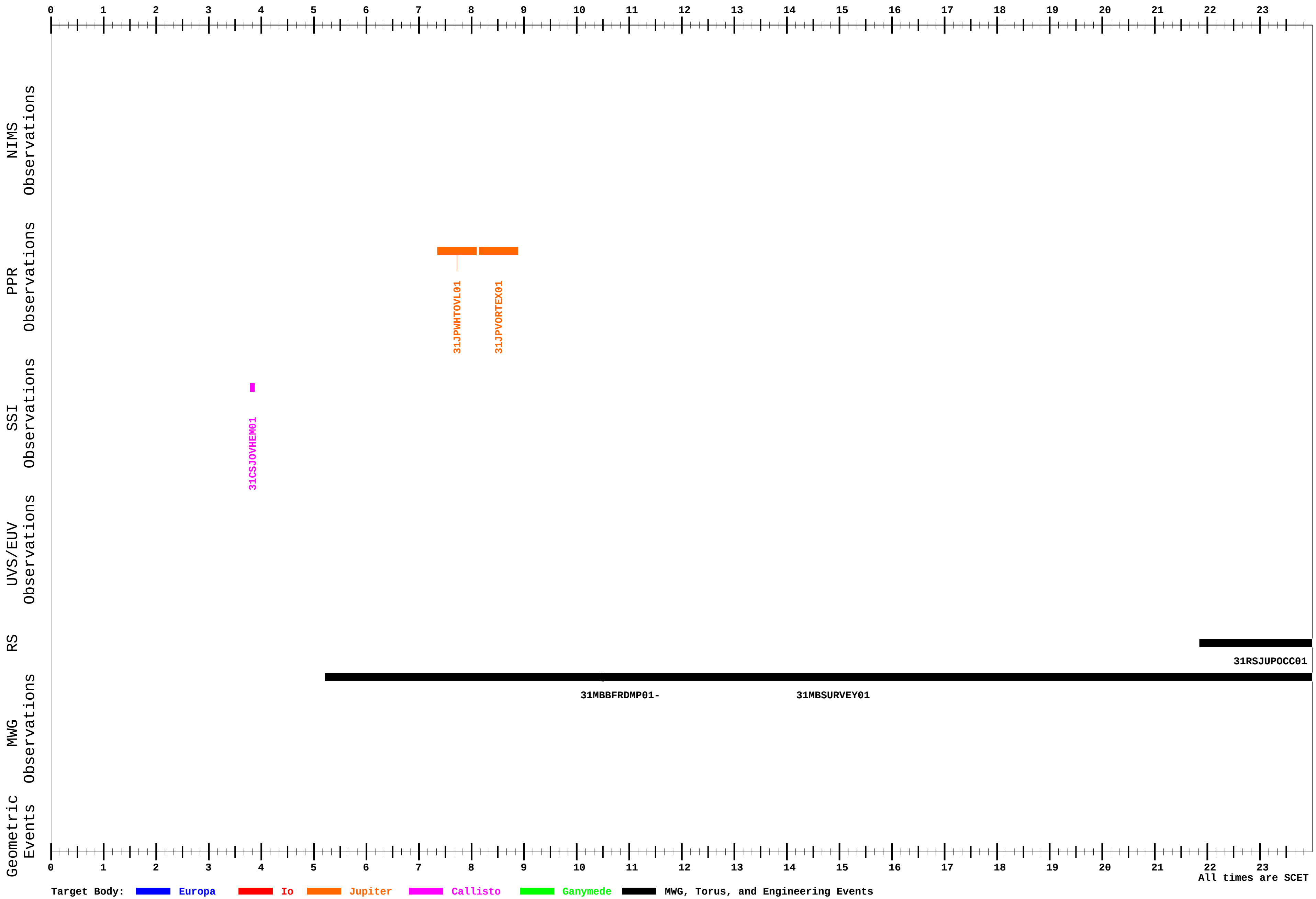

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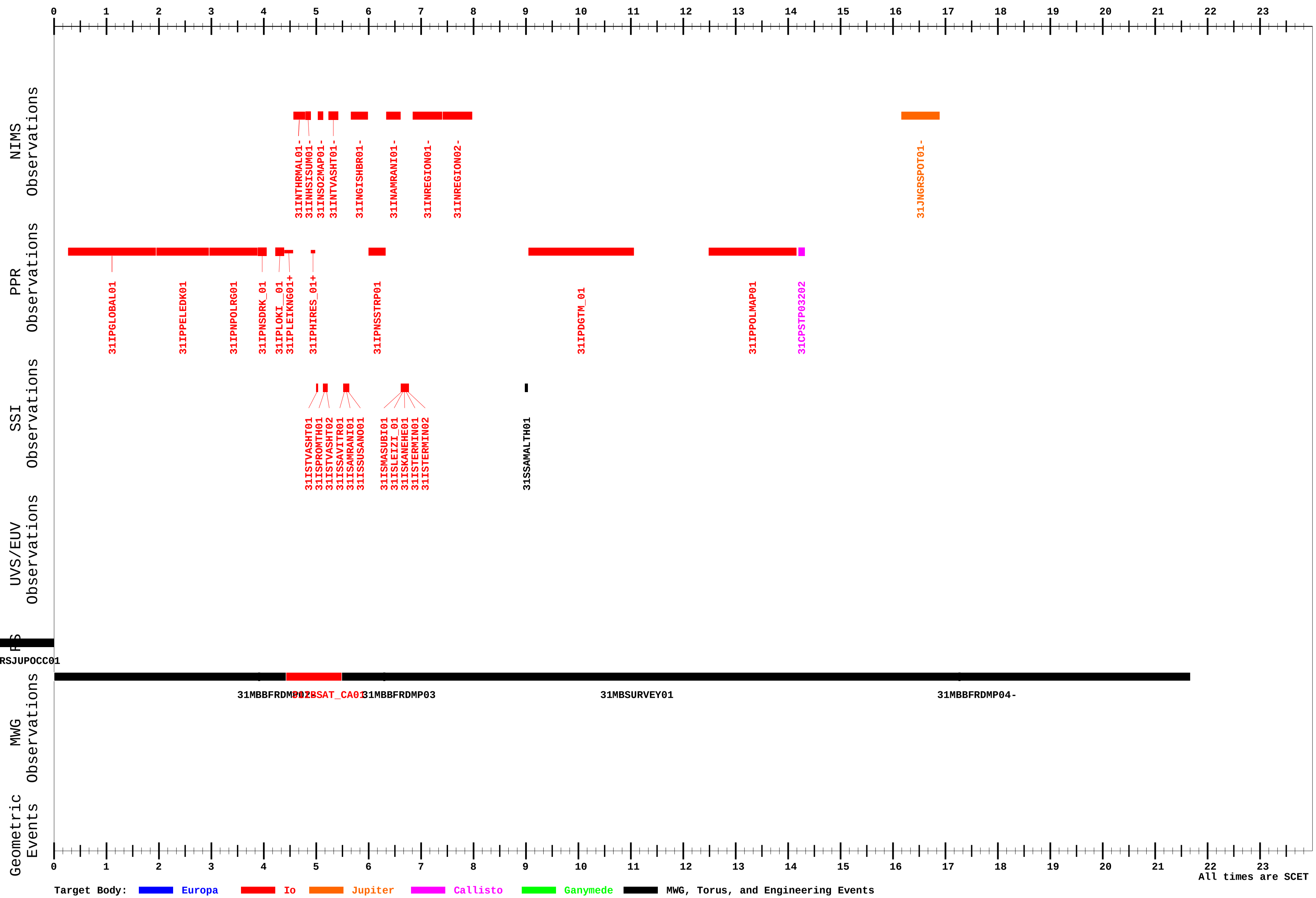

GEM: I31

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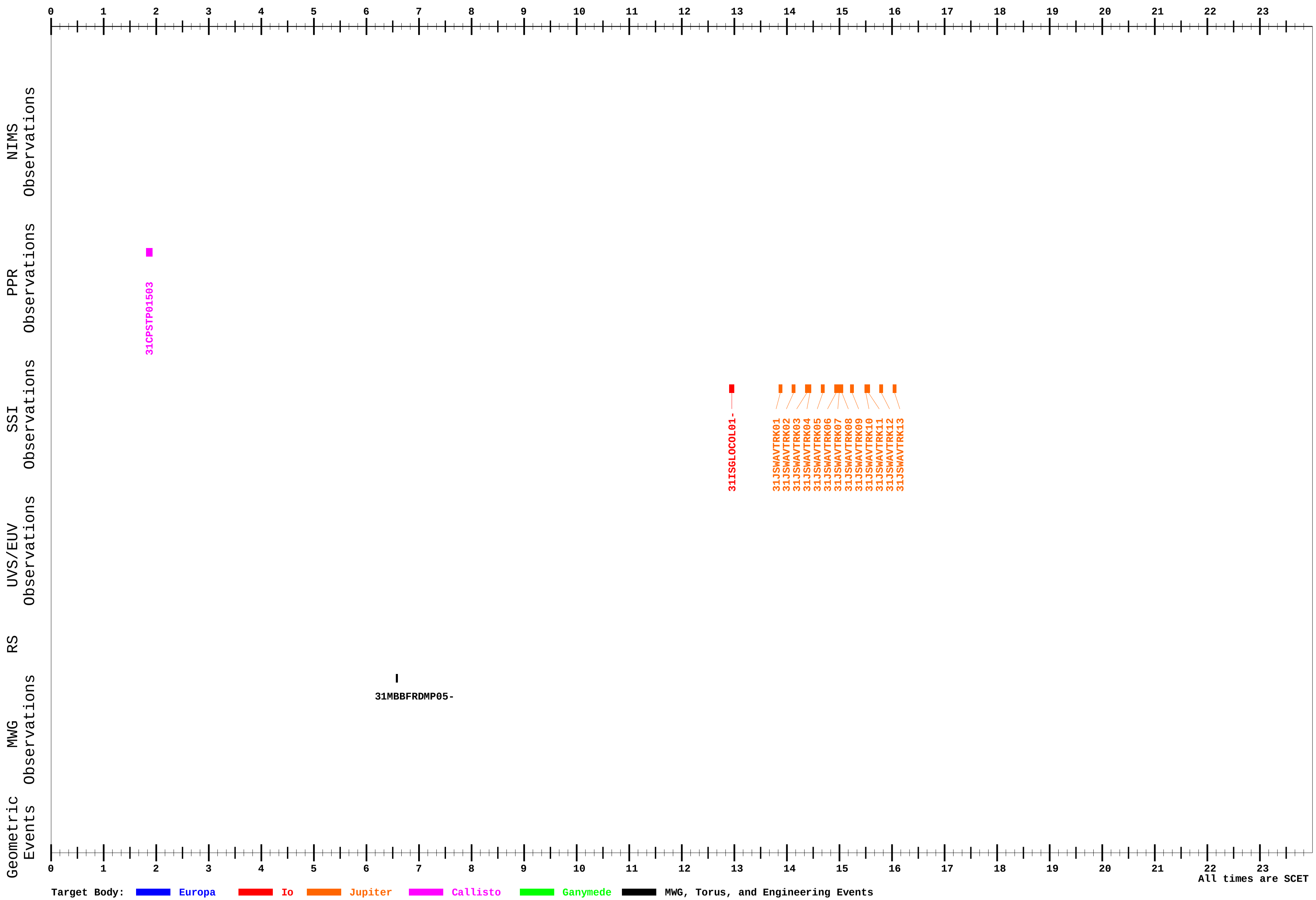
Date of Plot: 18-Jul-101 13: 1:57



GEM: I31

I31 ENCOUNTER
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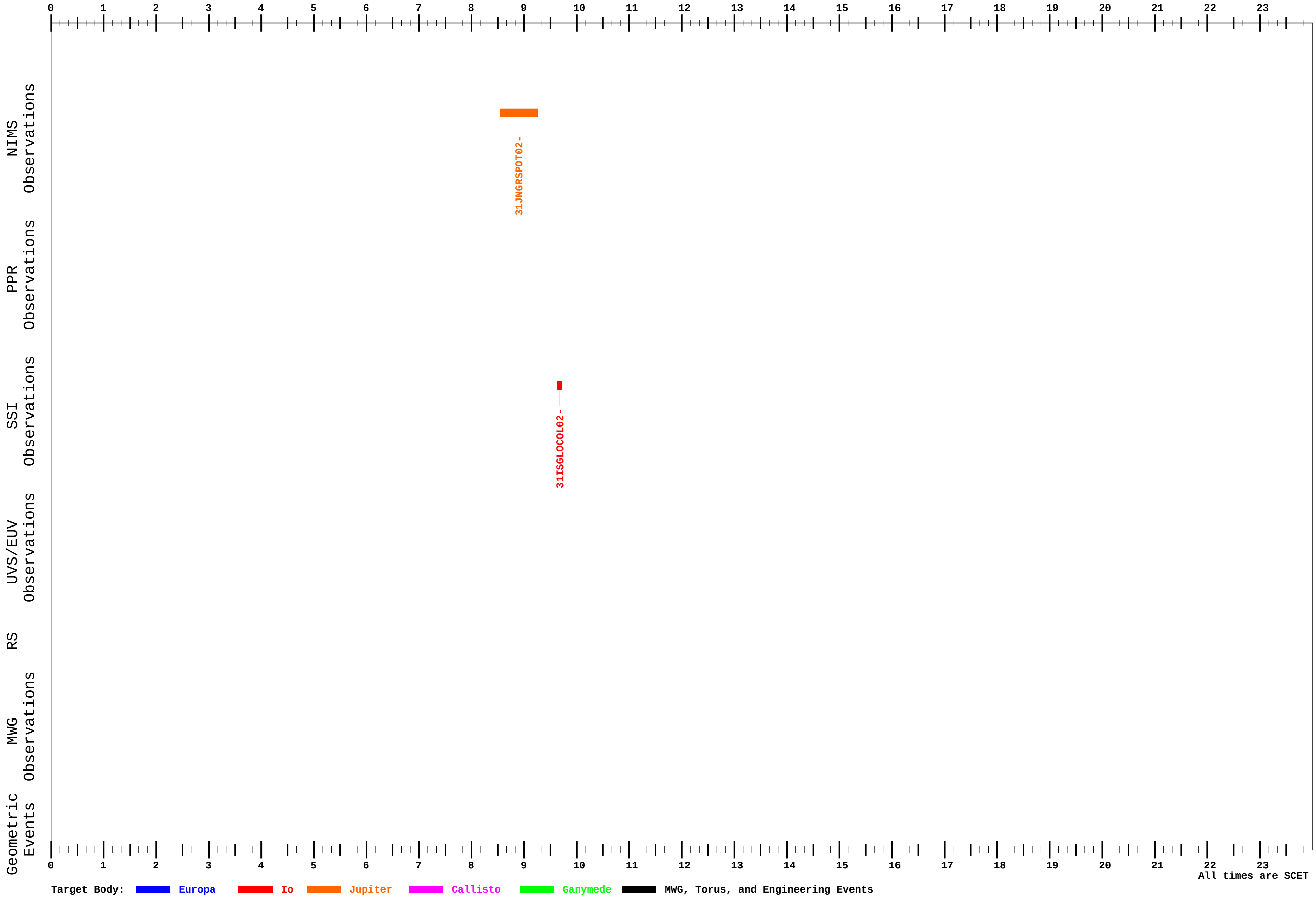
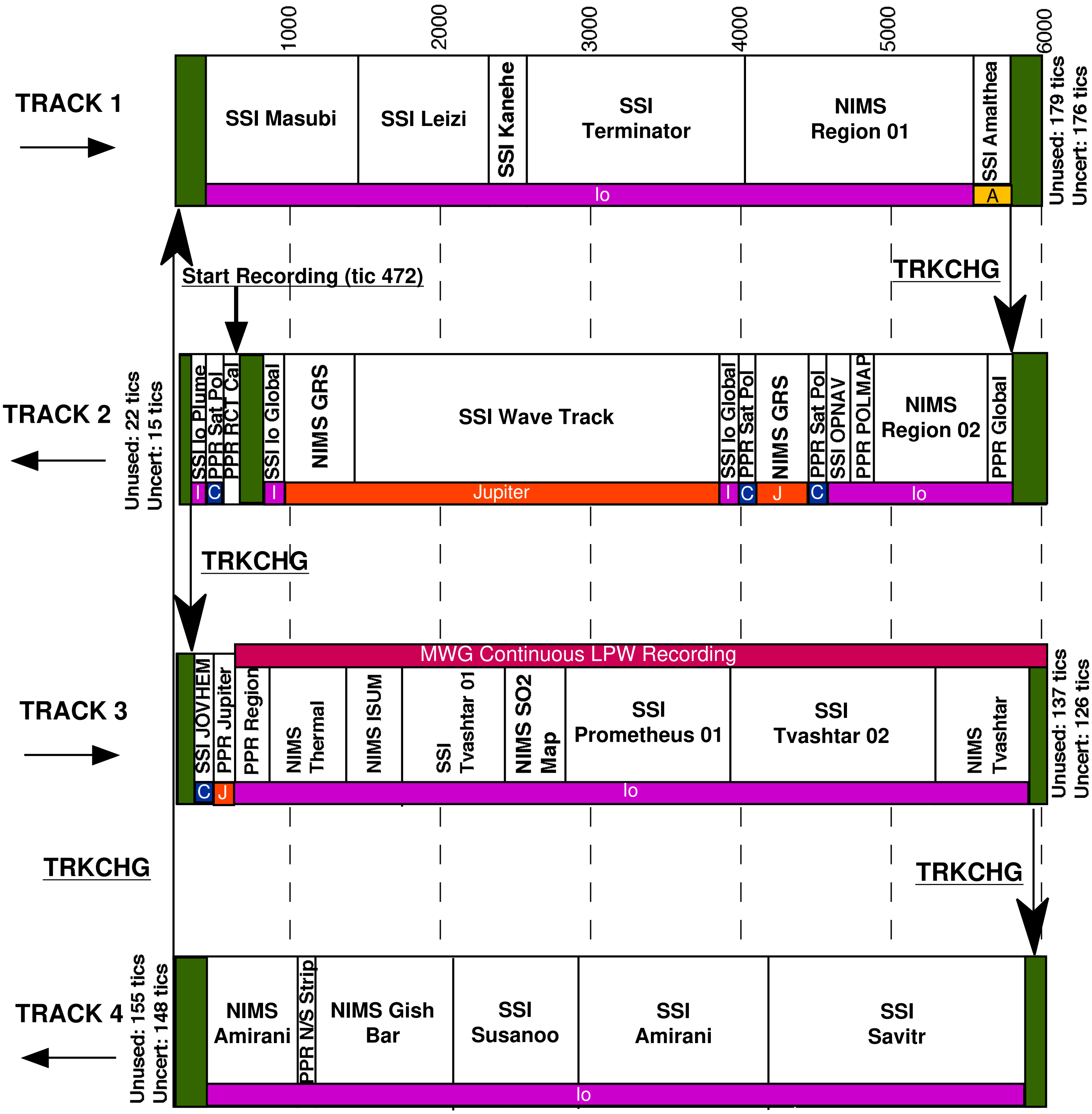
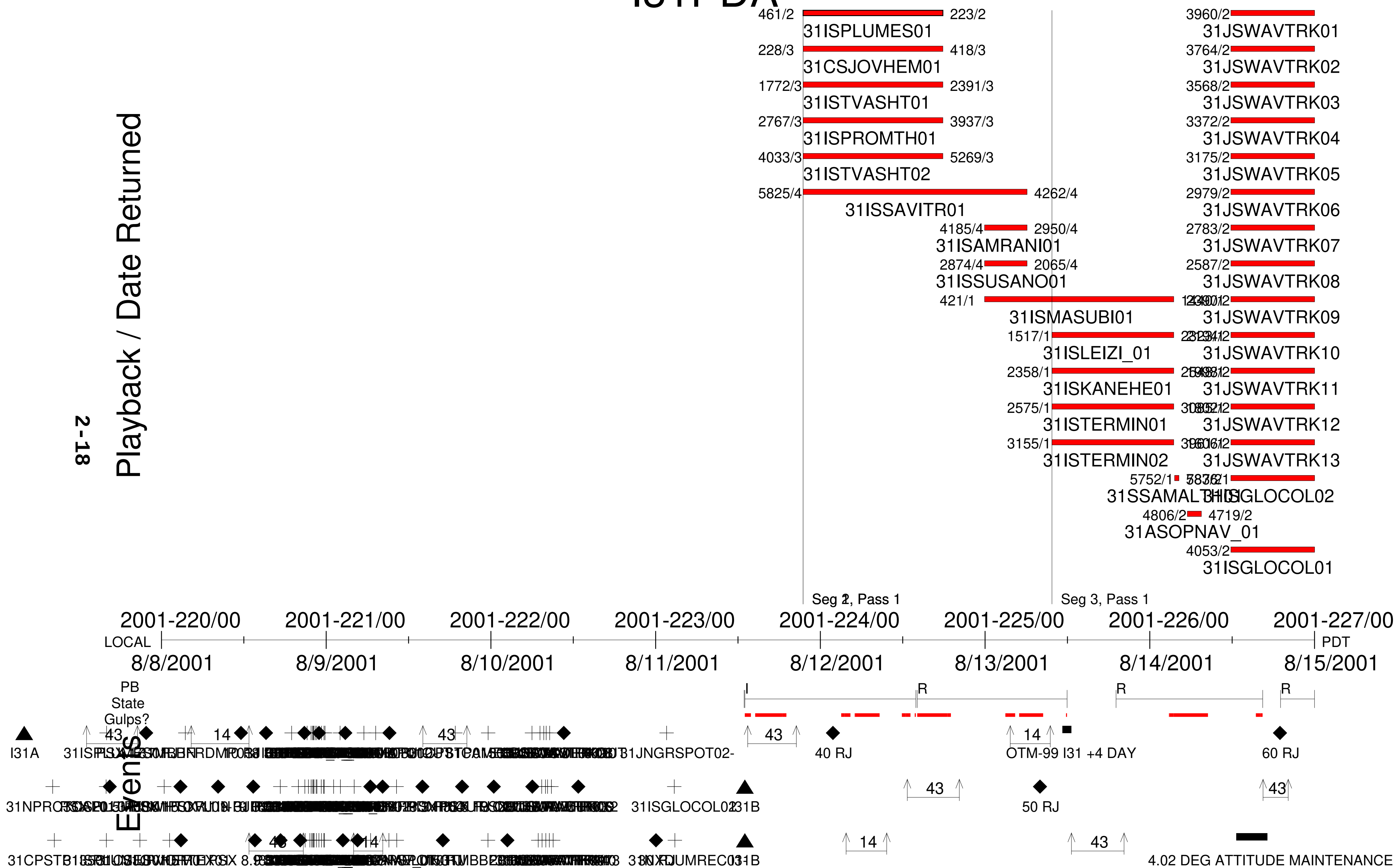


I31 ENCOUNTER HIGH-LEVEL TAPEMAP



L. Barnard 7/13/01

I31PDA



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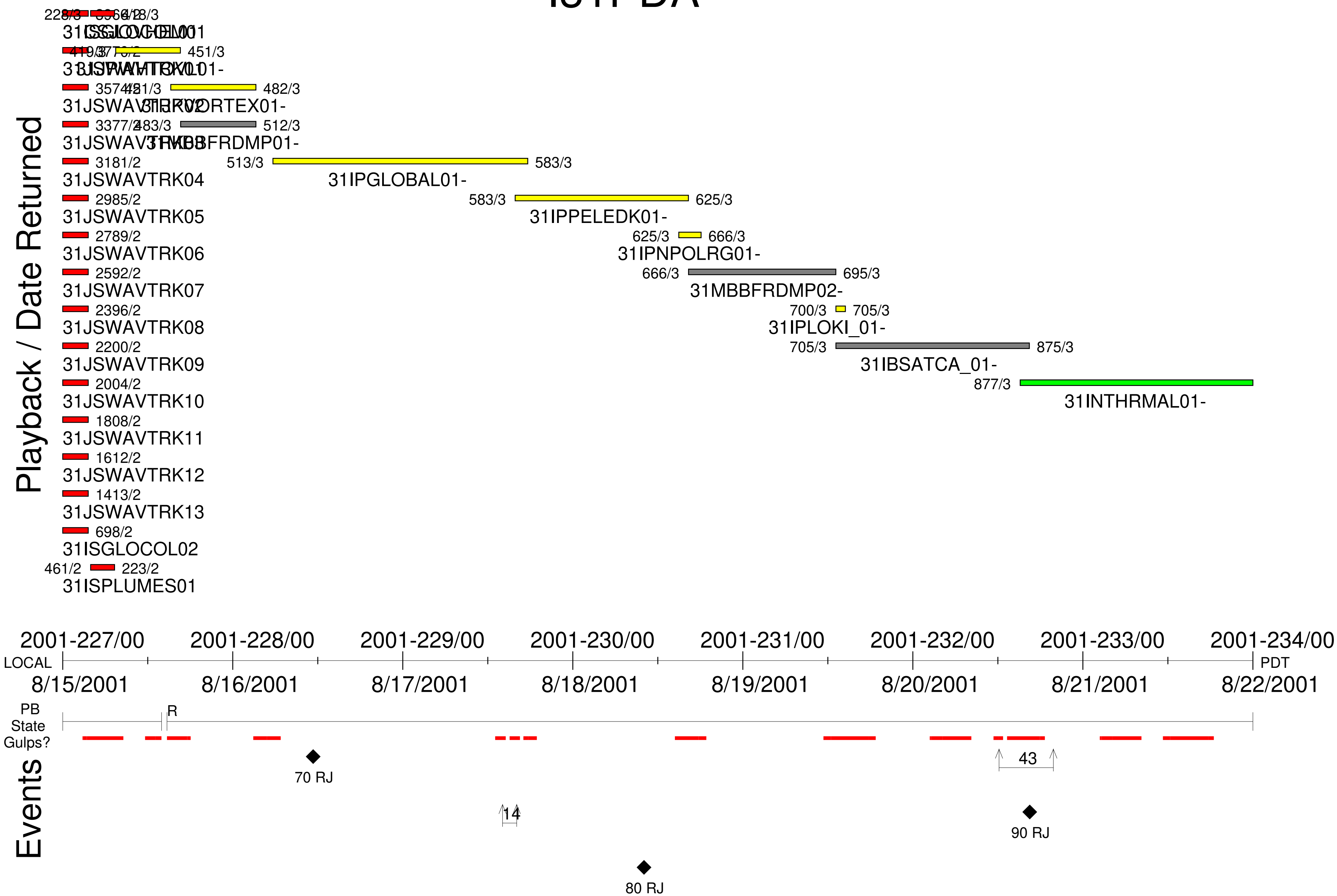

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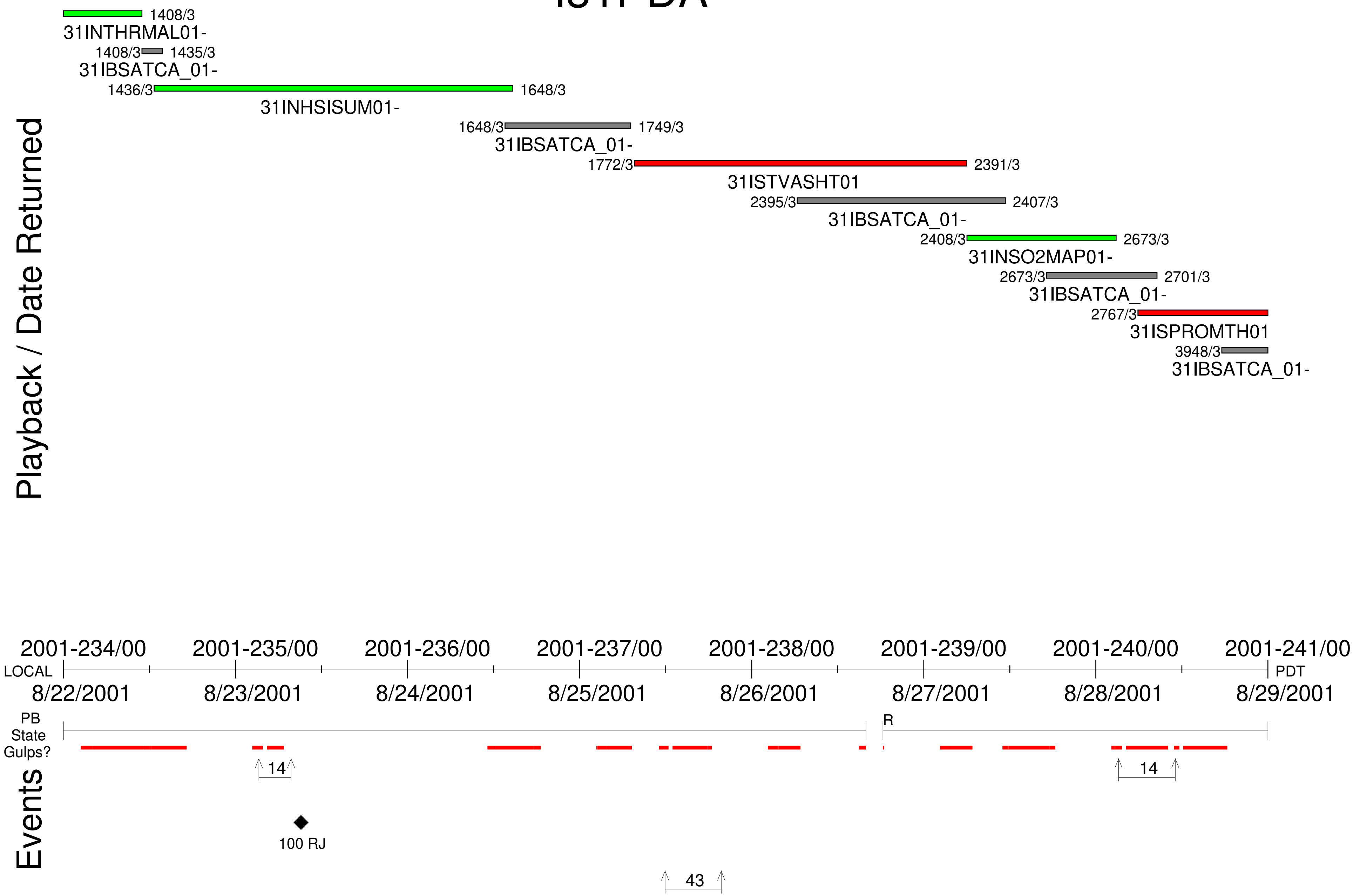

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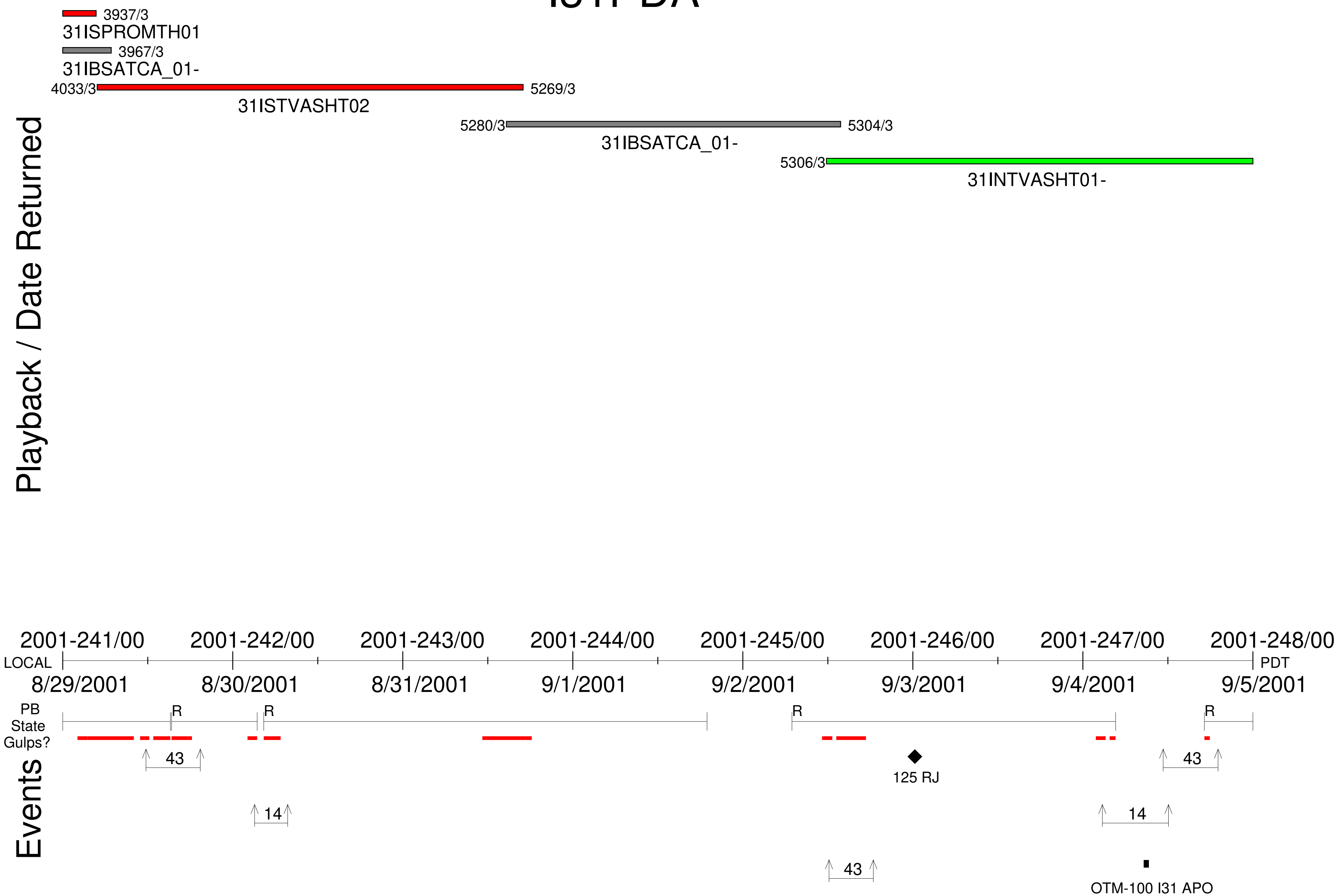

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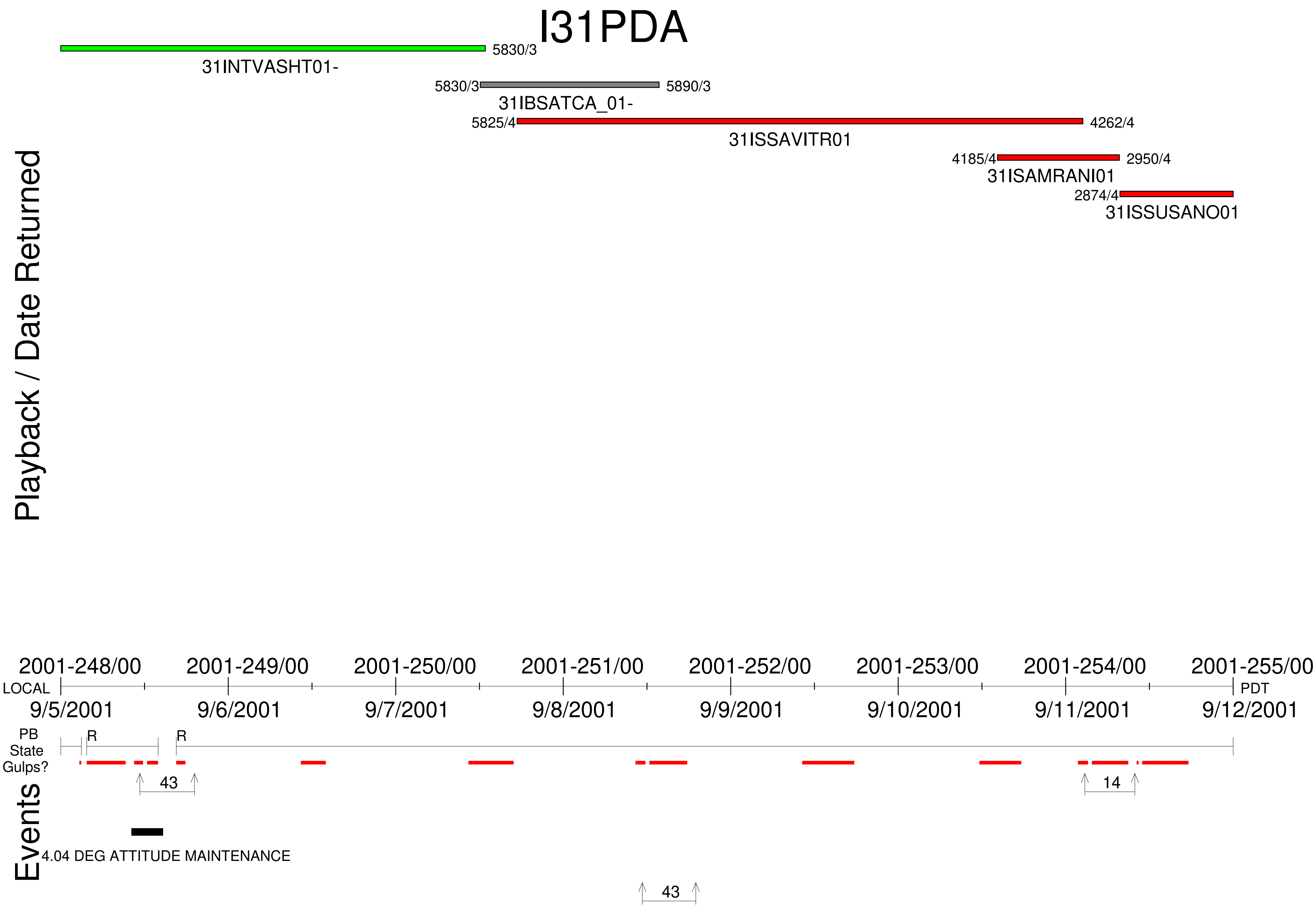

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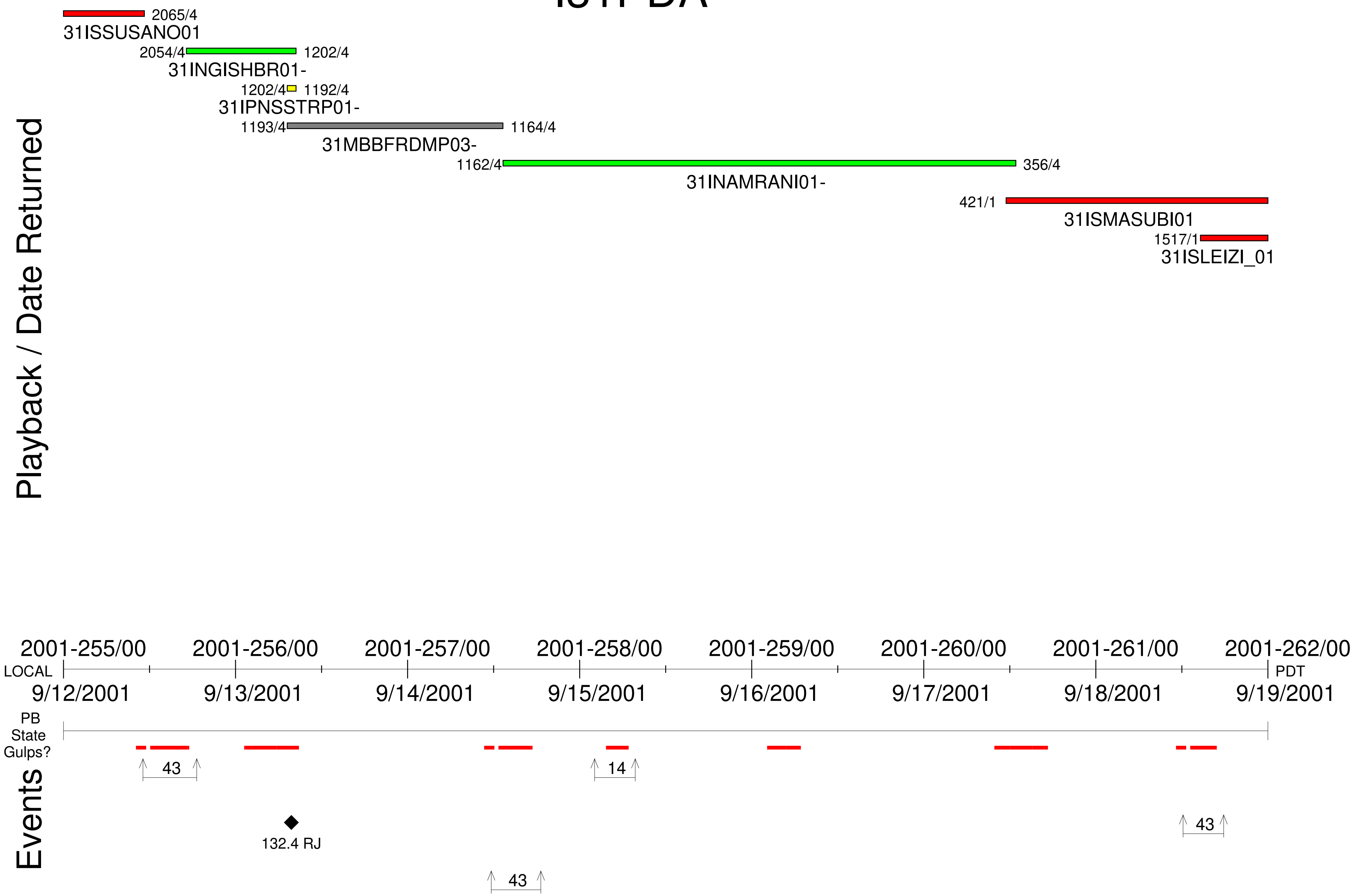

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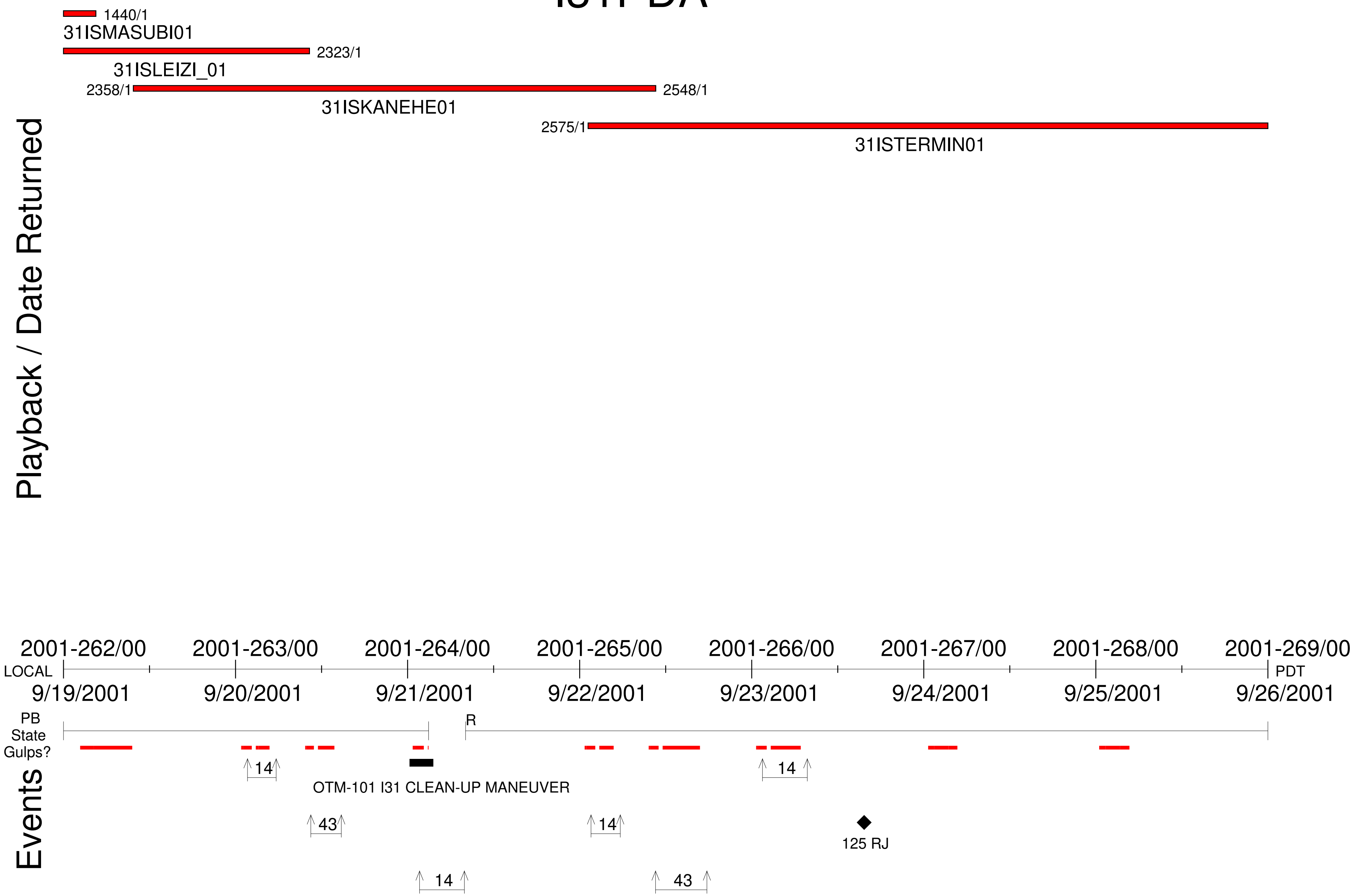

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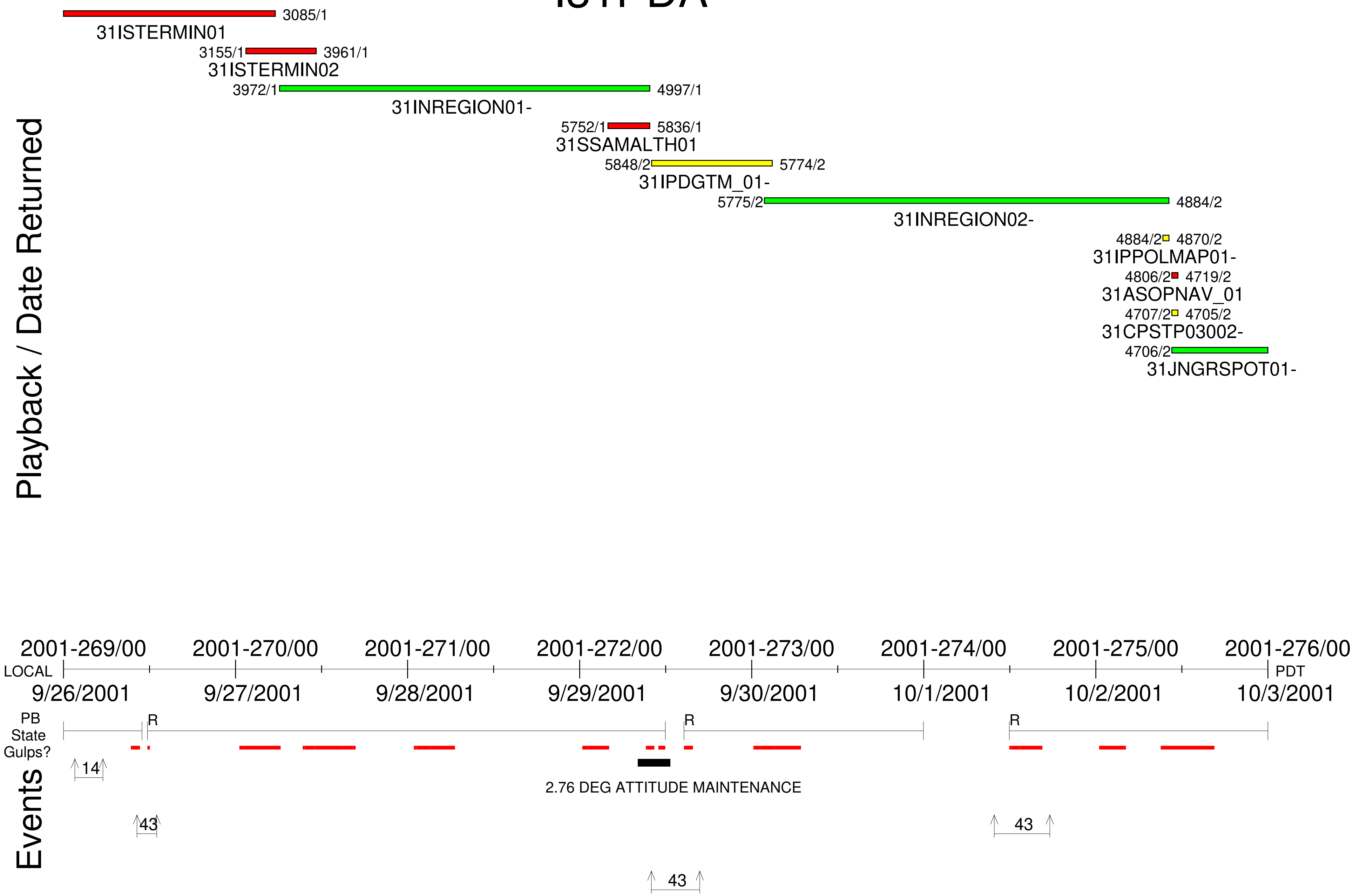

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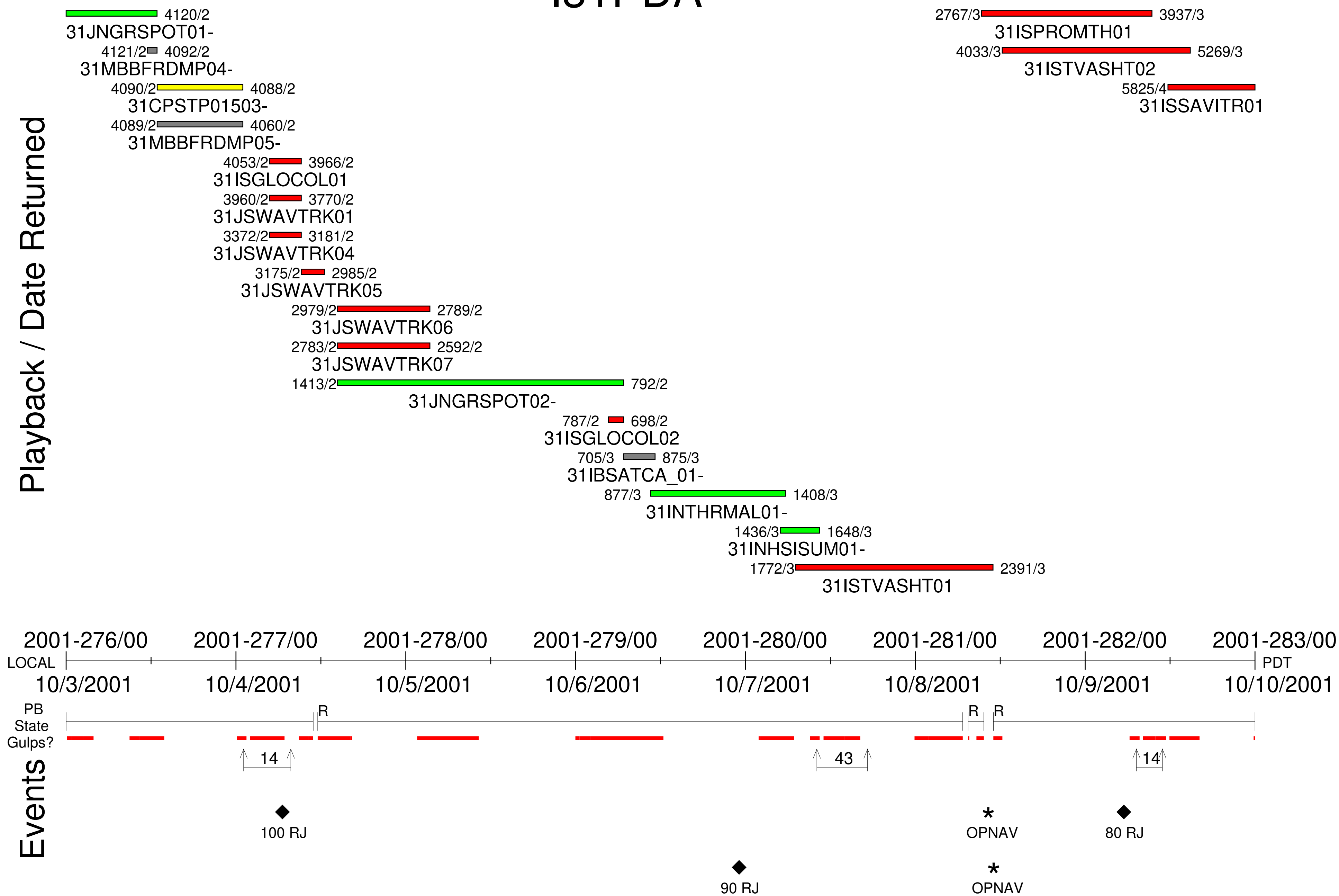
Playback / Date Returned
4120/2
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4121/2 4092/2
31MBBFRDMP04-
4090/2 4088/2
31CPSTP01503-
4089/2 4060/2
31MBBFRDMP05-
4053/2 3966/2
31ISGLOCOL01
3960/2 3770/2
31JSWAVTRK01
3372/2 3181/2
31JSWAVTRK04
3175/2 2985/2
31JSWAVTRK05
2979/2 2789/2
31JSWAVTRK06
2783/2 2592/2
31JSWAVTRK07
1413/2 792/2
31JNGRSPOT02-
787/2 698/2
31ISGLOCOL02
705/3 875/3
31IBSATCA_01-
877/3 1408/3
31INTHRMAL01-
1436/3 1648/3
31INHSISUM01-
1772/3 2391/3
31ISTVASHT01
2767/3 3937/3
31ISPROMTH01
4033/3 5269/3
31ISTVASHT02
5825/4
31ISSAVITR01
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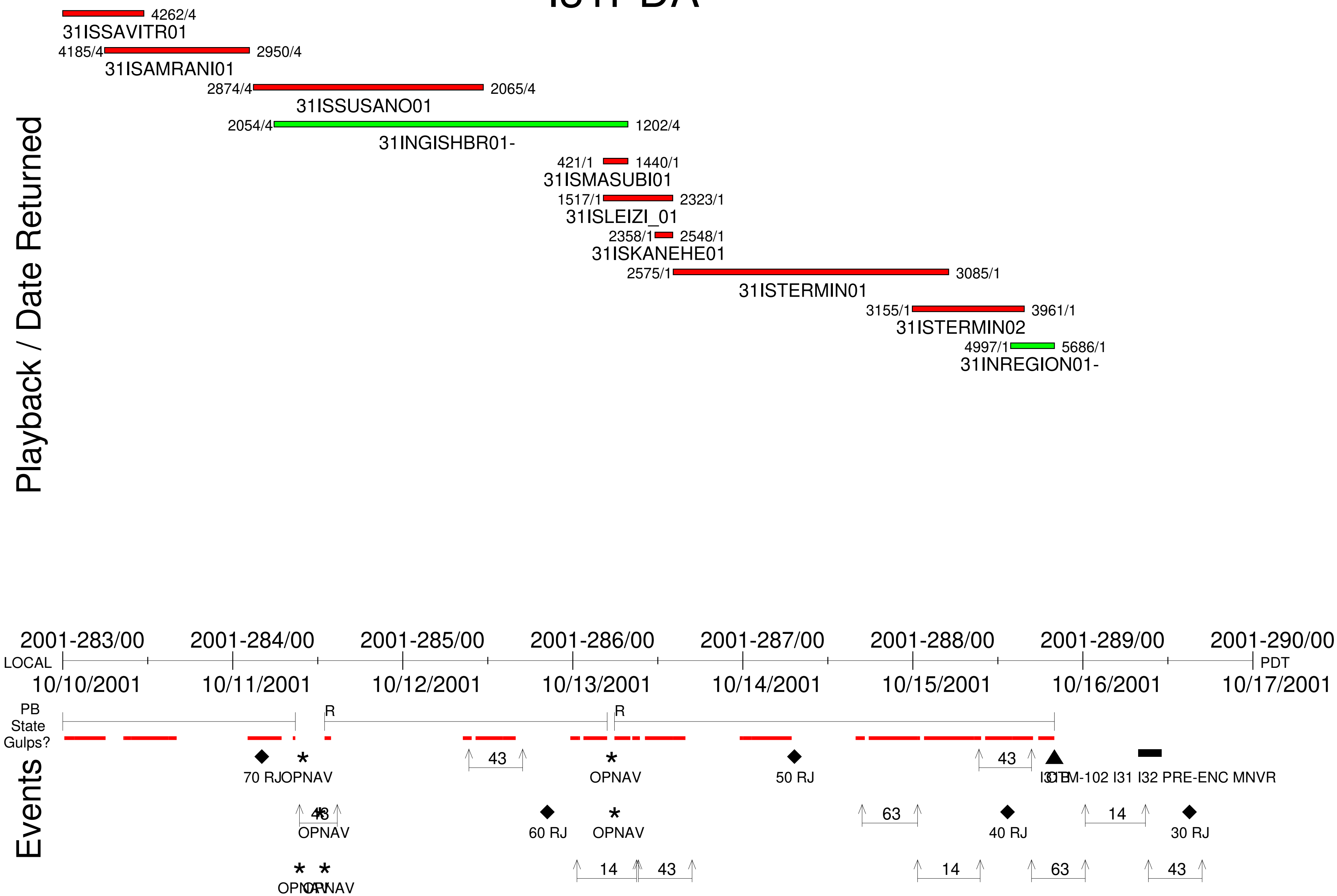

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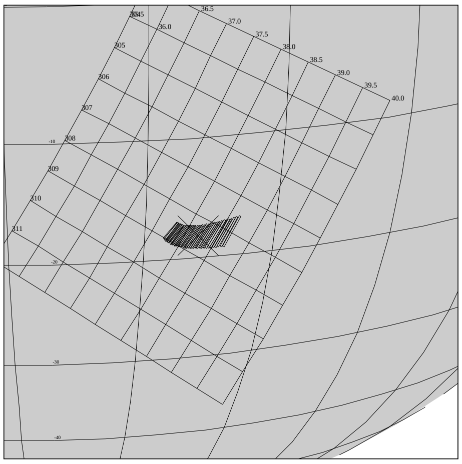
I31 NIMS A



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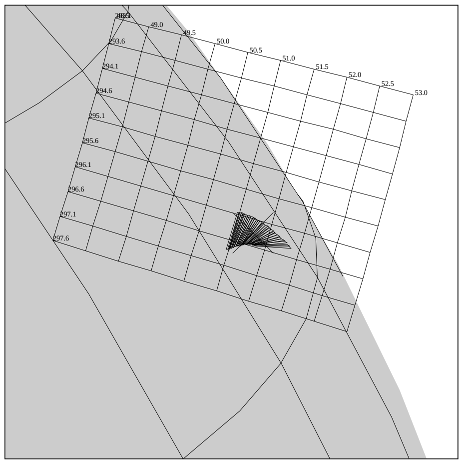

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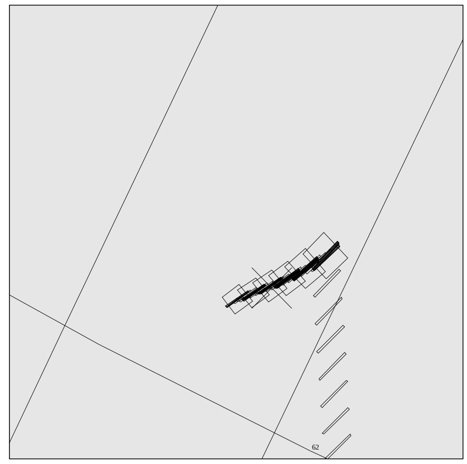

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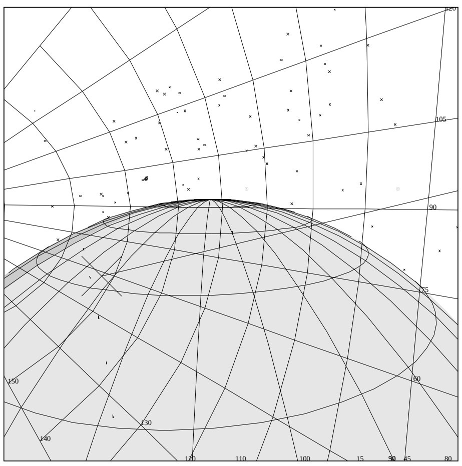

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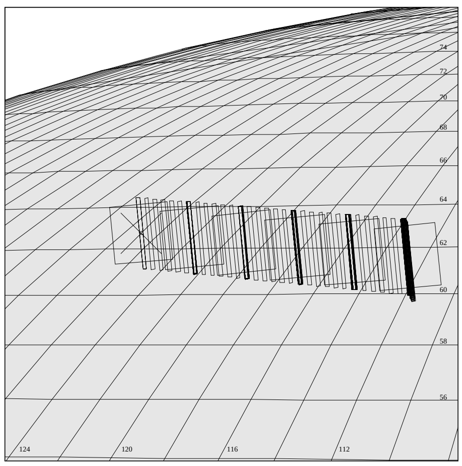

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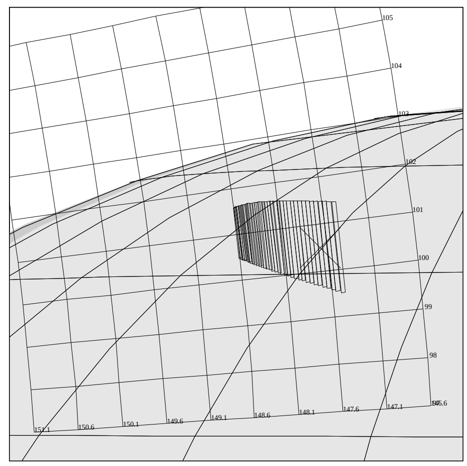

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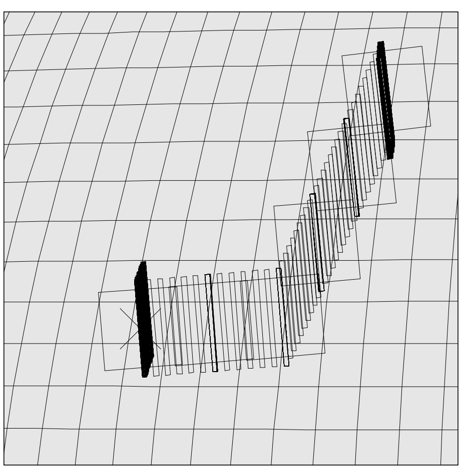

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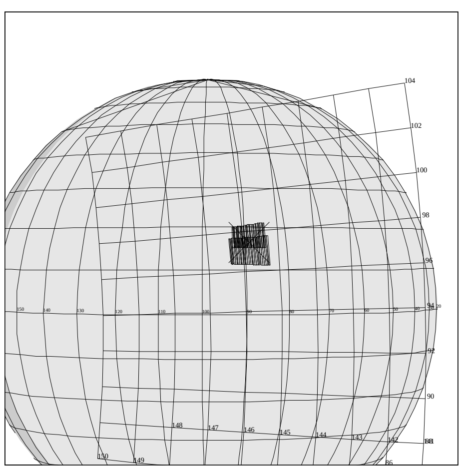

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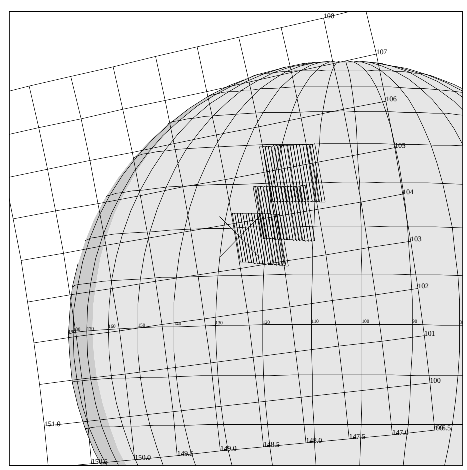

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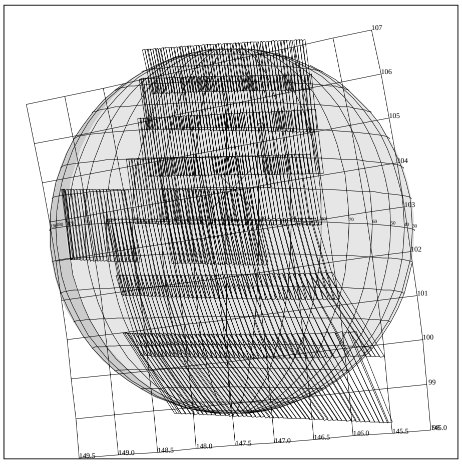
I31 NIMS B



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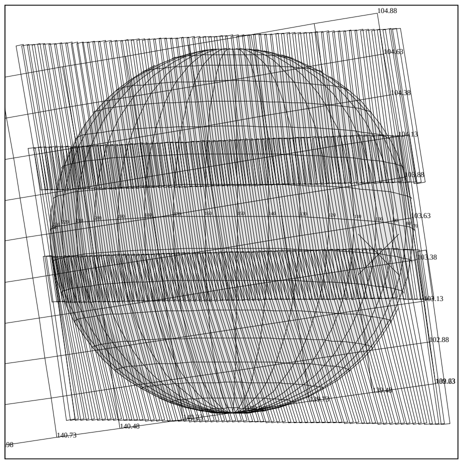

31INREGION02

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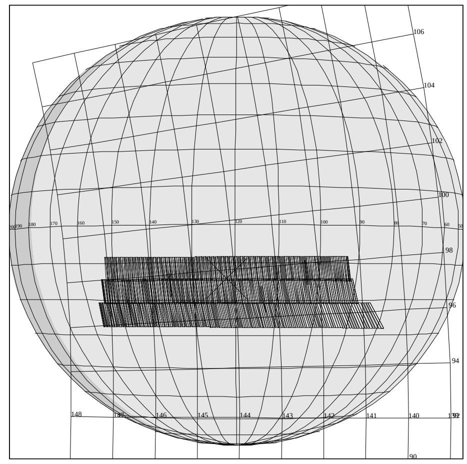

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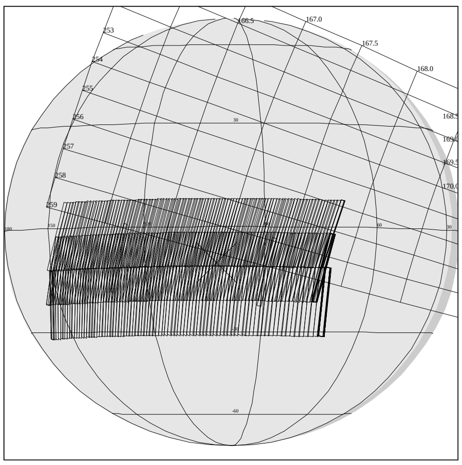

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