Chapter 6 - Data Return

Contents

Introduction to Chapter 6

Data Return

The Ida data were recorded on tape during the Ida Encounter and partially played back over a number of months. Due to the low data rates, not all of the NIMS Ida observations were returned. Efforts were made to locate IDA in the NIMS data using jailbar searches and then, using assumptions based on the design of the mosaics, small segments of selected mosaics were returned so as to maximize Ida data return. Unfortunately a problem with the scan platform gyros caused the spacecraft to change from inertial mode to cruise mode, causing the mosaics and scan platform slews to execute in an unpredictable manner such that dark sky data was returned instead of Ida data in many cases. A discussion of the scan platform problems follows later in this chapter.

The NIMS data are stored in EDRs (Experiment Data Records) produced by JPL-MIPS (Multi-mission Image Processing System). The NIMS EDR is described in the NIMS Experiment Data Record SIS (Software Interface Specification) Number 232-08. This document is part of the Galileo Project document GLL-625-610. The NIMS EDR file name is determined by the start time (SCLK) of the data. It begins with the letter "N", which is followed by the partition number, RIM and MOD91 counts; the file extension is a number which represents the version number of duplicate files. For example, if the clock is in its second cycle and the first record’s SCLK is equal to 12345678.90.7, and this is the first such EDR, then the file will be named: "N21234567890.1".

The MIPS-generated EDRs have a Vicar label, followed by a PDS/ISIS label, binary header records and the data records. For archiving on CD-ROM, the Vicar labels are detached (but kept separately on the CD) and the file is renamed so as to conform to the 8.3 DOS file-naming convention as follows: The initial "N" becomes an "E", the partition number is preserved, the RIM count is split between the name and the extension, and a final character (A,B,...) is added to the extension to distinguish any EDRs that start in the same RIM. For example, the MIPS EDR N21234567890.1 becomes E2123456.78A.

Along with this NIMS Guide, other files are distributed on the NIMS EDR CD to help describe the NIMS data. Among these files are the OBSCAT, OBSPLN and RIMCAT. The OBSCAT is very similar to the OBSTAB described below in this chapter and as well as in its PDS label on the CD. The OBSPLN, the planned OBSTAB, is a table similar to the planned Obstab found in Chapter 4 of this NIMS Guide. It is also described in its PDS label on the CD. The RIMCAT is a table which describes the NIMS EDR data on a RIM by RIM basis. It contains one entry (row) for each RIM of each NIMS EDR. The RIMCAT may be used to track instument mode and state changes, etc. It too is described in its PDS label on the CD.

The table on the following four pages, the NIMS Obstab (Observation Table), is a time-ordered listing of the NIMS observation parameters for the data returned from the Ida Encounter. It will be used for systematic processing of the EDR data into cubes and tubes. The NIMS Obstab found in Chapter 4 of this NIMS Guide is the Planned Obstab - the Observation Table for the NIMS data that was sent to the spacecraft's tape recorder.

The table on the following five pages gives a brief summary of the NIMS data returned for the Ida Encounter. Since Ida's position and velocity were not well known during the planning stages of the Ida observations, a large amount of empty space was scanned in each mosaic to ensure that Ida would be observed. As stated above, due to limited down-link capabilities and low data rates, not all Ida observations were returned. Only portions of some mosaics were returned. For each NIMS EDR the SCLK range is given along with the OAPEL names of the NIMS observations that take place during that time period. For each observation the time ranges for which data were returned along with the time ranges in which NIMS actually observed Ida are listed, along with additional comments. Dactyl, Ida's moon, was detected in three NIMS observations: IDUNIDAFIN01, IDUNIDACHM01 and IDUSHIRES_01. The time ranges for when NIMS saw Dactyl are also listed in this table. The last three NIMS EDRs in this table contain NIMS boresight, PCT and RCT calibration data.

Next in this chapter is a NIMS memo which discusses the scan platform's anomalous behavior during the Ida Fly-by. Towards the beginning of the Ida Encounter the scan platform gyros were turned off due to a perceived overheating of the gyros. The response of the AACS was to switch from inertial mode to cruise mode for the rest of the encounter. The cone actuator has a different response in cruise mode than in inertial mode. All mosaics executed in cruise mode were affected by this response difference. Sometimes the mosaics were executed with slight deviations from the predicted mosaic, sometimes with large offsets in execution and sometimes not at all! Examples of the scan platform behavior are given in this section. This change in the execution of the scan platform behavior had a large effect on the amount of NIMS Ida data returned. Once Ida's position was determined more precisely, the plan was to return only the data in which NIMS would see Ida. This plan was based on the assumption of how the scan platform behaved in inertial mode. Since the scan platform behaved in a manner different from that predicted, NIMS did not see Ida in many of the small segments of mosaics that were returned. This problem was greatest in the first half of the encounter sequence where Ida's size was of the order of a few NIMS pixels and the mosaics were of short duration. The mosaics in the second half of the Ida encounter were longer in duration so that they still completed even though they were executed in cruise mode. The scan platform's behavior, though, was still very erratic in these large mosaics, as illustrated in the attached memo.

Even with the constraints of limited data return and the problems with the anomalous scan platform behavior, the NIMS Ida observations which had the highest priority were returned, along with the bonus of finding and observing Dactyl, Ida's moon.

NIMS Obstab (Data Returned)

Heading	Columns	Comments
OAPEL	1 - 12	.Oapel Name (NIMS aliases Used)
EXT	14 - 14	.Extension (allow for split OAPELs)
PSID	16 - 17	.2 Letter ID for the OAPEL
SCLK1	19 - 29	.Start time of OBS in SCLK
SCLK2	31 - 41	.STOP time of OBS in SCLK
MODE	43 - 44	.NIMS Instrument MODE
GAIN	46 - 47	.Gain State (true value)
CHOP	49 - 50	.Chopper State (1=Ref,2=63Hz,3=FreeRun,4=Off)
GRAT_OFF	52 - 53	.Grating Offset
PTAB_A(6)	55 - 71	.First PTAB (repeat count,mirror op,autobias...
PTAB_B(6)	73 - 89	.Second PTAB (...grating start, grating delta...
		. (...number of grating postions)
ECAL	92 - 92	.Electronics Calibration Active (1=yes)
OPCAL	94 - 94	.Optics Calibration active (1=yes)
UTC1	96 - 112	.Start time of OBS in UTC (from SEF - ISO STANDARD)
REAL_TIME	115 - 115	.NIMS in Real-Time Telemetry (1=yes)
RECORD	117 - 117	.NIMS in Record Telemetry(1=yes)
TARGET	120 - 127	.Primary Target of OBS
		IDA - U - Ida
		CALIBRATION - N - Non-Science

(the single letter abbreviation appears as the third character in the OBSNAME (OAPEL Name)).

INPUT SEF FILE: EJ3_930727.SEF

OAPEL, EXT, PSID, SCLK1, SCLK2, MODE, GAIN, CHOP, GRAT_OFF, PTAB_A(6), PTAB_B(6), ECAL, OPCAL, UTC1, REAL_TIME, RECORD, TARGET

OAPEL	EXT	PSID	SCLK1	SCLK2	M	G	C	O	PTAB A						PTAB B						E	O	UTC1	R	T	TARGET
IDNNOPCAL_01	A	JA	02010188:04	02010188:45	3	4	1	4	1	1	0	0	1	24	1	1	0	0	1	24	1	0	1993-229T20:41:31	0	1	CAL
IDNNECAL__01	A	JB	02015540:04	02015540:39	1	2	1	4	1	1	0	0	2	12	1	1	0	0	2	12	0	1	1993-233T14:52:59	0	1	CAL
IDUNRTURXM01	A	IA	02025305:00	02025305:14	7	4	1	4	1	1	0	6	0	12	1	1	0	6	0	12	0	0	1993-240/11:26:25	0	1	IDA
IDUSROTATI01	A	IA	02025307:19	02025307:25	7	4	1	4	1	1	0	6	0	12	1	1	0	6	0	12	0	0	1993-240/11:28:39	0	1	IDA
IDUNRT15SM03	A	IA	02025392:11	02025392:28	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/12:54:31	0	1	IDA

OAPEL	EXT	PSID	SCLK1	SCLK2	M	G	C	O	PTAB A						PTAB B						E	O	UTC1	R	T	TARGET
IDUNRTURXM02	A	JF	02025396:90	02025397:00	7	4	1	4	1	1	0	6	0	12	1	1	0	6	0	12	0	0	1993-240/12:59:26	0	1	IDA
IDUNRTURXM02	B	JF	02025397:22	02025397:25	7	4	1	4	1	1	0	6	0	12	1	1	0	6	0	12	0	0	1993-240/12:59:41	0	1	IDA
IDUSROTATI02	A	JF	02025399:16	02025399:29	7	4	1	4	1	1	0	6	0	12	1	1	0	6	0	12	0	0	1993-240/13:01:39	0	1	IDA
IDUSROTATI02	B	JF	02025399:70	02025399:73	7	4	1	4	1	1	0	6	0	12	1	1	0	6	0	12	0	0	1993-240/13:02:15	0	1	IDA
IDUSROTATI02	C	JF	02025400:18	02025400:25	7	4	1	4	1	1	0	6	0	12	1	1	0	6	0	12	0	0	1993-240/13:02:41	0	1	IDA
IDUSROTATI02	D	JF	02025400:70	02025400:73	7	4	1	4	1	1	0	6	0	12	1	1	0	6	0	12	0	0	1993-240/13:03:15	0	1	IDA
IDUSROTATI02	E	JF	02025401:16	02025401:29	7	4	1	4	1	1	0	6	0	12	1	1	0	6	0	12	0	0	1993-240/13:03:39	0	1	IDA
IDUSROTATI02	F	JF	02025401:66	02025401:72	7	4	1	4	1	1	0	6	0	12	1	1	0	6	0	12	0	0	1993-240/13:04:13	0	1	IDA
IDUNRTURXM02	A	JF	02025403.19	02025403.25	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/13:05:43	0	1	IDA
IDUNRTURXM02	B	JF	02025403.69	02025404.07	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/13:05:17	0	1	IDA
IDUNRTURXM02	C	JF	02025404.20	02025404.54	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/13:05:56	0	1	IDA
IDUNRT15SM04	A	JF	02025414:66	02025414:74	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/13:17:21	0	1	IDA
IDUNRT15SM04	A	JF	02025415:19	02025415:26	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/13:17:51	0	1	IDA
IDUSROTATI02	G	JF	02025422:13	02025422:35	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/13:24:52	0	1	IDA
IDUNRT30SM03	A	JF	02025426:19	02025426:47	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/13:28:59	0	1	IDA
IDUNRT30SM03	B	JF	02025426:49	02025426:53	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/13:29:19	0	1	IDA
IDUNRT30SM03	C	JF	02025426:69	02025426:74	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/13:29:32	0	1	IDA
IDUNRT30SM03	D	JF	02025427:19	02025427:30	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/13:29:59	0	1	IDA
IDUNRT15SM05	A	JF	02025437:69	02025437:74	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/13:40:39	0	1	IDA
IDUNRT15SM05	B	JF	02025438:19	02025438:26	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/13:41:03	0	1	IDA
IDUNRT15SM05	C	JF	02025438:69	02025438:74	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/13:41:40	0	1	IDA
IDUSROTATI02	H	JF	02025445:20	02025445:27	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/13:48:12	0	1	IDA
IDUNRT30SM04	A	JF	02025449:19	02025449:54	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/13:52:14	0	1	IDA
IDUNRT30SM04	B	JF	02025449:69	02025449:75	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/13:53:48	0	1	IDA
IDUNRT30SM04	C	JF	02025450:19	02025450:27	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/13:53:14	0	1	IDA
IDUNRT15SM06	A	JF	02025460:69	02025460:75	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/14:03:54	0	1	IDA
IDUNRT15SM06	B	JF	02025461:19	02025461:27	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/14:04:22	0	1	IDA
IDUNRTURXM03	A	JI	02025465:22	02025465:27	7	4	1	4	1	1	0	6	0	12	1	1	0	6	0	12	0	0	1993-240/14:08:26	0	1	IDA
IDUNROTATI03	A	JI	02025468:19	02025468:26	7	4	1	4	1	1	0	6	0	12	1	1	0	6	0	12	0	0	1993-240/14:11:26	0	1	IDA
IDUNROTATI03	B	JI	02025468:70	02025468:72	7	4	1	4	1	1	0	6	0	12	1	1	0	6	0	12	0	0	1993-240/14:12:00	0	1	IDA
IDUNROTATI03	C	JI	02025469:20	02025469:26	7	4	1	4	1	1	0	6	0	12	1	1	0	6	0	12	0	0	1993-240/14:12:27	0	1	IDA
IDUNROTATI03	D	JI	02025469:70	02025469:72	7	4	1	4	1	1	0	6	0	12	1	1	0	6	0	12	0	0	1993-240/14:13:01	0	1	IDA
IDUNROTATI03	E	JI	02025470:19	02025470:25	7	4	1	4	1	1	0	6	0	12	1	1	0	6	0	12	0	0	1993-240/14:13:28	0	1	IDA
IDUNROTATI03	F	JI	02025470:65	02025470:73	7	4	1	4	1	1	0	6	0	12	1	1	0	6	0	12	0	0	1993-240/14:13:58	0	1	IDA

OAPEL	EXT	PSID	SCLK1	SCLK2	M	G	C	O	PTAB A						PTAB B						E	O	UTC1	R	T	TARGET
IDUNRT90FM03	A	JI	02025472:18	02025472:28	1	4	1	4	1	1	0	0	2	12	1	1	0	0	2	12	0	0	1993-240/14:15:28	0	1	IDA
IDUNRT90FM03	B	JI	02025472:67	02025473:07	1	4	1	4	1	1	0	0	2	12	1	1	0	0	2	12	0	0	1993-240/14:16:01	0	1	IDA
IDUNRT90FM03	C	JI	02025473:18	02025473:24	1	4	1	4	1	1	0	0	2	12	1	1	0	0	2	12	0	0	1993-240/14:16:29	0	1	IDA
IDUNRT90FM03	D	JI	02025473:61	02025473:89	1	4	1	4	1	1	0	0	2	12	1	1	0	0	2	12	0	0	1993-240/14:16:57	0	1	IDA
IDUNRT15SM07	A	JI	02025484:21	02025484:48	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/14:27:39	0	1	IDA
IDUNROTATI03	G	JI	02025491:14	02025491:36	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/14:34:39	0	1	IDA
IDUNROTATI03	H	JI	02025491:40	02025491:56	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/14:34:56	0	1	IDA
IDUNRT30SM05	A	JI	02025495:25	02025495:79	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/14:39:49	0	1	IDA
IDUNROTATI03	I	JI	02025514:19	02025514:26	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/14:57:57	0	1	IDA
IDUNROTATI03	J	JI	02025514:66	02025514:72	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/14:58:29	0	1	IDA
IDUNROTATI03	K	JI	02025515:66	02025515:72	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/14:59:30	0	1	IDA
IDUNROTATI03	L	JI	02025516:21	02025516:27	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/15:00:00	0	1	IDA
IDUNRT15SM09	A	JI	02025530:72	02025530:74	5	4	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/15:14:43	0	1	IDA
IDUNRTURXM04	A	JL	02025534:90	02025535:22	7	3	1	4	1	1	0	6	0	12	1	1	0	6	0	12	0	0	1993-240/15:18:58	0	1	IDA
IDUNROTATI04	A	JL	02025537:18	02025537:22	7	3	1	4	1	1	0	6	0	12	1	1	0	6	0	12	0	0	1993-240/15:21:12	0	1	IDA
IDUNROTATI04	B	JL	02025538:18	02025538:25	7	3	1	4	1	1	0	6	0	12	1	1	0	6	0	12	0	0	1993-240/15:22:14	0	1	IDA
IDUNROTATI04	C	JL	02025539:18	02025539:25	7	3	1	4	1	1	0	6	0	12	1	1	0	6	0	12	0	0	1993-240/15:22:14	0	1	IDA
IDUNROTATI04	D	JL	02025539:64	02025539:70	7	3	1	4	1	1	0	6	0	12	1	1	0	6	0	12	0	0	1993-240/15:23:43	0	1	IDA
IDUNRT90FM04	A	JL	02025541:32	02025542:32	1	3	1	4	1	1	0	0	2	12	1	1	0	0	2	12	0	0	1993-240/15:25:24	0	1	IDA
IDUNROTATI04	E	JL	02025548:18	02025548:25	1	3	1	4	1	1	0	0	2	12	1	1	0	0	2	12	0	0	1993-240/15:32:19	0	1	IDA
IDUNRT15SM10	A	JL	02025552:84	02025553:21	5	3	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/15:37:05	0	1	IDA
IDUNROTATI04	F	JL	02025560:19	02025560:27	5	3	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/15:44:28	0	1	IDA
IDUNROTATI04	G	JL	02025560:64	02025560:71	5	3	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/15:44:58	0	1	IDA
IDUNROTATI04	H	JL	02025561:19	02025561:26	5	3	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/15:45:28	0	1	IDA
IDUNROTATI04	I	JL	02025562:19	02025562:26	5	3	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/15:46:28	0	1	IDA
IDUNROTATI04	J	JL	02025562:64	02025562:71	5	3	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/15:46:59	0	1	IDA
IDUNRT30SM07	A	JL	02025564:29	02025564:57	5	3	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/15:48:37	0	1	IDA
IDUNROTATI04	K	JL	02025571:18	02025571:25	5	3	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/15:55:34	0	1	IDA
IDUNROTATI04	L	JL	02025572:19	02025572:26	5	3	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/15:57:08	0	1	IDA
IDUNROTATI04	M	JL	02025573:20	02025573:27	5	3	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/15:57:36	0	1	IDA
IDUNROTATI04	N	JL	02025573:64	02025573:71	5	3	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/15:58:06	0	1	IDA
IDUNROTATI04	O	JL	02025583:19	02025583:26	5	3	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/16:07:43	0	1	IDA
IDUNROTATI04	P	JL	02025584:19	02025584:25	5	3	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/16:08:44	0	1	IDA
IDUNROTATI04	Q	JL	02025585:19	02025585:25	5	3	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/16:09:44	0	1	IDA
IDUNROTATI04	R	JL	02025585:64	02025585:71	5	3	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/16:10:14	0	1	IDA
IDUNRT30SM08	A	JL	02025587:33	02025587:60	5	3	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/16:11:55	0	1	IDA
IDUNROTATI04	S	JL	02025594:19	02025594:25	5	3	1	4	1	1	0	2	4	6	1	1	0	2	4	6	0	0	1993-240/16:18:50	0	1	IDA

```
OAPEL      EXT PSID SCLK1       SCLK2      M  G  C  O  |    PTAB A     |  |    PTAB B     |  E O      UTC1          R T  TARGET
-----------------------------------------------------------------------------------------------------------------------------
IDUNLONMAP01 A IQ 02025605:11 02025605:25  3  3  1  4  1  1  0  0  1 24  1  1  0  0  1 24  0 0 1993-240/16:29:53  0 1  IDA
IDUNLONMAP01 B IQ 02025606:10 02025606:26  3  3  1  4  1  1  0  0  1 24  1  1  0  0  1 24  0 0 1993-240/16:30:53  0 1  IDA
IDUNLONMAP01 C IQ 02025607:14 02025607:23  3  3  1  4  1  1  0  0  1 24  1  1  0  0  1 24  0 0 1993-240/16:31:56  0 1  IDA
IDUNLONMAP01 D IQ 02025607:56 02025607:69  3  3  1  4  1  1  0  0  1 24  1  1  0  0  1 24  0 0 1993-240/16:32:24  0 1  IDA

IDUNIDAFIN01 A KG 02025609:06 02025611:82  3  3  1  4  1  1  0  0  1 24  1  1  0  0  1 24  0 0 1993-240/16:33:52  0 1  IDA

IDUNLONMAP02 A IB 02025612:80 02025612:85  3  3  1  4  1  1  0  0  1 24  1  1  0  0  1 24  0 0 1993-240/16:37:44  0 1  IDA
IDUNLONMAP02 B IB 02025613:16 02025613:20  3  3  1  4  1  1  0  0  1 24  1  1  0  0  1 24  0 0 1993-240/16:38:02  0 1  IDA
IDUNLONMAP02 C IB 02025613:28 02025613:33  3  3  1  4  1  1  0  0  1 24  1  1  0  0  1 24  0 0 1993-240/16:38:09  0 1  IDA
IDUNLONMAP02 D IB 02025613:41 02025613:46  3  3  1  4  1  1  0  0  1 24  1  1  0  0  1 24  0 0 1993-240/16:38:17  0 1  IDA
IDUNLONMAP02 E IB 02025613:54 02025613:59  3  3  1  4  1  1  0  0  1 24  1  1  0  0  1 24  0 0 1993-240/16:38:27  0 1  IDA
IDUNLONMAP02 F IB 02025615:85 02025615:89  3  3  1  4  1  1  0  0  1 24  1  1  0  0  1 24  0 0 1993-240/16:40:48  0 1  IDA

IDUNIDACHM01 A KH 02025616:11 02025616:77  5  3  1  4  1  1  0  2  4  6  1  1  0  2  4  6  0 0 1993-240/16:41:00  0 1  IDA
IDUNIDACHM01 B KH 02025617:11 02025618:16  5  3  1  4  1  1  0  2  4  6  1  1  0  2  4  6  0 0 1993-240/16:42:00  0 1  IDA
IDUNIDACHM01 C KH 02025618:11 02025618:88  5  3  1  4  1  1  0  2  4  6  1  1  0  2  4  6  0 0 1993-240/16:43:01  0 1  IDA
IDUNIDACHM01 D KH 02025619:11 02025620:52  5  3  1  4  1  1  0  2  4  6  1  1  0  2  4  6  0 0 1993-240/16:44:01  0 1  IDA

IDUNHISPAT01 A IC 02025622:74 02025622:77  7  3  1  4  1  1  0  6  0 12  1  1  0  6  0 12  0 0 1993-240/16:47:46  0 1  IDA
IDUNHISPAT01 B IC 02025622:82 02025622:84  7  3  1  4  1  1  0  6  0 12  1  1  0  6  0 12  0 0 1993-240/16:47:51  0 1  IDA
IDUNHISPAT01 C IC 02025623:02 02025623:25  7  3  1  4  1  1  0  6  0 12  1  1  0  6  0 12  0 0 1993-240/16:47:59  0 1  IDA
IDUNHISPAT01 D IC 02025623:29 02025623:51  7  3  1  4  1  1  0  6  0 12  1  1  0  6  0 12  0 0 1993-240/16:48:16  0 1  IDA
IDUNHISPAT01 E IC 02025624:28 02025624:52  7  3  1  4  1  1  0  6  0 12  1  1  0  6  0 12  0 0 1993-240/16:49:17  0 1  IDA

IDUNIDACA_01 A IE 02025627:80 02025627:90  7  3  1  4  1  1  0  6  0 12  1  1  0  6  0 12  0 0 1993-240/16:52:53  0 1  IDA

IDUNBORCAL01 A KB 02025658:54 02025660:16  7  4  1  4  1  1  0  6  0 12  1  1  0  6  0 12  0 0 1993-240/17:23:56  0 1  SKY

IDUNPCTCAL01 A EH 02026289:81 02026289:90  3  4  1  4  1  1  0  0  1 24  1  1  0  0  1 24  0 0 1993-241/04:02:15  0 1  CAL
IDUNPCTCAL01 B EH 02026290:00 02026290:90  3  1  1  4  1  1  0  0  1 24  1  1  0  0  1 24  0 0 1993-241/04:02:21  0 1  CAL
IDUNPCTCAL01 C EH 02026291:00 02026291:04  7  1  1  4  1  1  0  6  0 12  1  1  0  6  0 12  0 0 1993-241/04:03:23  0 1  CAL

IDUNRCTCAL01 A EI 02028619:74 02028620:90  1  3  1  4  1  1  0  0  2 12  1  1  0  0  2 12  0 0 1993-242/19:18:04  0 1  CAL
IDUNRCTCAL01 B EI 02028621:00 02028621:07  5  3  1  4  1  1  0  2  4  6  1  1  0  2  4  6  0 0 1993-242/19:19:16  0 1  CAL
-----------------------------------------------------------------------------------------------------------------------------
```

NIMS IDA DATA

NIMS_EDR	NIMS EDR filename.
SCLK1	NIMS EDR Start SCLK (RIM.MF).
SCLK2	NIMS EDR End SCLK (RIM.MF).
NR	Number of Data Records (MFs).
NF	Number of 0-Fill Records (MFs).
OAPEL	Observation Name.
IDA	IDA Seen in Data: X = Yes, 0 = No, M = Moon (Dactyl, aka Elvis)
MODE	NIMS Mode.
DATA_RANGE	SCLK Range (RIM:MF - RIM:MF) of Data Segment.
IDA_RANGE	SCLK Range (RIM:MF - RIM:MF) Where IDA Is Seen By NIMS Within the Data Segment.
COMMENTS	The Comment ’High DN’ means DN greater than about 100.

NOTES:
1) Any NIMS EDR may contain data from multiple Observations (OAPELs).
2) Sub-MF fragments were not cataloged; valid NIMS IDA data may occur in fragments within the latter EDRs due to jailbar searches.
3) If an Observation (OAPEL) is missing from this table, then there wasn’t any significant data returned for that Observation.

FEL 01mar95

NIMS_EDR	SCLK 1	SCLK2	(NR, NF)	OAPEL	IDA	MODE	DATA_RANGE	IDA_RANGE	COMMENTS
N10201018804.2	2010188.04	2010188.45	(42, 0)	OPNAV 4	0	LM	(88.04 - 88.45)		OPCAL
N10201554004.2	2015540.04	2015540.39	(36, 20)	OPNAV 5	0	FM	(40.04 - 40.39)		ECAL
N10202530500.2	2025305.00	2025305.14	(15, 0)	IDUNRTURXM01	X	XM	(05.00 - 05.14)	(05.08 - 05.08)	
N10202530719.2	2025307.19	2025307.25	(7, 0)	IDUSROTATI01	0	XM	(07.19 - 07.25)		
N10202539211.2	2025392.11	2025392.28	(18, 0)	IDUNRT15SM03	0	SM	(92.11 - 92.28)		
N10202539690.2	2025396.90	2025399.73	(257, 233)	IDUNRTURXM02	0	XM	(96.90 - 97.00)		
				IDUNRTURXM02	0	XM	(97.22 - 97.25)		
				IDUSROTATI02	0	XM	(99.16 - 99.29)		
				IDUSROTATI02	0	XM	(99.70 - 99.73)		

NIMS IDA DATA

NIMS_EDR	SCLK 1	SCLK2	(NR, NF)	OAPEL	IDA	MODE	DATA_RANGE	IDA_RANGE	COMMENTS
N10202540018.2	2025400.18	2025404.54	(401, 294)	IDUSROTATI02	0	XM	(00.18 - 00.25)		
				IDUSROTATI02	0	XM	(00.70 - 00.73)		
				IDUSROTATI02	X	XM	(01.16 - 01.29)	(01.27 - 01.29)	
				IDUSROTATI02	0	XM	(01.66 - 01.72)		
				IDUNRT90FM02	X	SM	(03.19 - 03.25)	(03.21 - 03.21)	
				IDUNRT90FM02	0	SM	(03.69 - 04.07)		
				IDUNRT90FM02	0	SM	(04.20 - 04.54)		
N10202541469.2	2025414.69	2025415.26	(49, 35)	IDUNRT15SM04	0	SM	(14.69 - 14.74)		
				IDUNRT15SM04	X	SM	(15.19 - 15.26)	(15.19 - 15.21)	HIGH DN
N10202542213.2	2025422.13	2025422.35	(23, 0)	IDUSROTATI02	X	SM	(22.13 - 22.35)	(22.29 - 22.29)	
N10202542619.2	2025426.19	2025427.26	(99, 51)	IDUNRT30SM03	X	SM	(26.19 - 26.47)	(26.31 - 26.37)	
				IDUNRT30SM03	X	SM	(26.49 - 26.53)	(26.53 - 26.53)	
				IDUNRT30SM03	0	SM	(26.69 - 26.74)		
				IDUNRT30SM03	0	SM	(27.19 - 27.26)		
N10202543769.2	2025437.69	2025438.74	(97, 75)	IDUNRT15SM05	0	SM	(37.69 - 37.74)		
				IDUNRT15SM05	0	SM	(38.19 - 38.26)		
				IDUNRT15SM05	0	SM	(38.69 - 38.74)		
N10202544520.2	2025445.20	2025445.27	(8, 0)	IDUSROTATI02	X	SM	(45.20 - 45.27)	(45.21 - 45.22)	
N10202544919.2	2025449.19	2025450.27	(100, 49)	IDUNRT30SM04	X	SM	(49.19 - 49.54)	(49.49 - 49.54)	HIGH DN
				IDUNRT30SM04	0	SM	(49.69 - 49.75)		
				IDUNRT30SM04	0	SM	(50.19 - 50.27)		
N10202546069.2	2025460.69	2025461.27	(50, 34)	IDUNRT15SM06	0	SM	(60.69 - 60.75)		
				IDUNRT15SM06	0	SM	(61.19 - 61.27)		
N10202546522.2	2025465.22	2025465.27	(6, 0)	IDUNRTURXM03	X	XM	(65.22 - 65.27)	(65.22 - 65.26)	HIGH DN

NIMS IDA DATA

NIMS_EDR	SCLK 1	SCLK2	(NR, NF)	OAPEL	IDA	MODE	DATA_RANGE	IDA_RANGE	COMMENTS
N10202546819.2	2025468.19	2025473.89	(526, 407)	IDUSROTATI03	0	XM	(68.91 - 68.26)		
				IDUSROTATI03	0	XM	(68.70 - 68.72)		
				IDUSROTATI03	X	XM	(69.20 - 69.26)	(69.22 - 69.26)	
				IDUSROTATI03	0	XM	(69.70 - 69.72)		
				IDUSROTATI03	X	XM	(70.19 - 70.25)	(70.19 - 70.25)	
				IDUSROTATI03	0	XM	(70.65 - 70.73)		
				IDUNRT90FM03	0	FM	(72.18 - 72.28)		
				IDUNRT90FM03	0	FM	(72.67 - 73.07)		
				IDUNRT90FM03	0	FM	(73.18 - 73.24)		
				IDUNRT90FM03	0	FM	(73.61 - 73.89)		
N10202548421.2	2025484.21	2025484.48	(28, 0)	IDUNRT15SM07	0	SM	(84.21 - 84.48)		
N10202549114.2	2025491.14	2025491.56	(43, 2)	IDUSROTATI03	X	SM	(91.14 - 91.36)	(91.19 - 91.25)	
				IDUSROTATI03	X	SM	(91.40 - 91.56)	(91.56 - 91.56)	
N10202549525.2	2025495.25	2025495.79	(55, 0)	IDUNRT30SM05	X	SM	(95.25 - 95.79)	(95.25 - 95.30)	
								(95.49 - 95.59)	HIGH DN
N10202551419.2	2025514.19	2025516.27	(191, 159)	IDUSROTATI03	X	SM	(14.19 - 14.26)	(14.19 - 14.19)	
				IDUSROTATI03	X	SM	(14.66 - 14.72)	(14.66 - 14.72)	HIGH DN
				IDUSROTATI03	X	SM	(15.66 - 15.72)	(15.66 - 15.72)	HIGH DN
				IDUSROTATI03	X	SM	(16.21 - 16.27)	(16.21 - 16.27)	HIGH DN
N10202553072.2	2025530.72	2025530.74	(3, 0)	IDUNRT15SM09	0	SM	(30.72 - 30.74)		
N10202553490.2	2025534.90	2025542.33	(672, 523)	IDUNRTURXM04	X	XM	(34.90 - 35.22)	(34.90 - 34.90)	
				IDUSROTATI04	X	XM	(37.18 - 37.25)	(37.19 - 37.25)	HIGH DN
				IDUSROTATI04	X	XM	(38.18 - 38.25)	(38.18 - 38.25)	HIGH DN
				IDUSROTATI04	X	XM	(39.18 - 39.25)	(39.18 - 39.25)	
				IDUSROTATI04	X	XM	(39.64 - 39.70)	(39.64 - 39.70)	
				IDUNRT90FM04	X	FM	(41.32 - 42.32)	(41.32 - 41.64)	HIGH DN, 2 MP

NIMS IDA DATA

NIMS_EDR	SCLK 1	SCLK2	(NR, NF)	OAPEL	IDA	MODE	DATA_RANGE	IDA_RANGE	COMMENTS
N10202554818.2	2025548.18	2025548.25	(8, 0)	IDUSROTATI04	X	FM	(48.18 - 48.25)	(48.18 - 48.25)	HIGH DN, 2 MP
N10202555284.2	2025552.84	2025553.21	(29, 0)	IDUNRT15SM10	X	SM	(52.84 - 53.21)	(52.84 - 53.16)	HIGH DN, 2 MP
N10202556019.2	2025560.19	2025564.57	(403, 336)	IDUSROTATI04	X	SM	(60.19 - 60.27)	(60.19 - 60.22)	
				IDUSROTATI04	X	SM	(60.64 - 60.71)	(60.67 - 60.71)	HIGH DN
				IDUSROTATI04	0	SM	(61.19 - 61.26)		
				IDUSROTATI04	0	SM	(62.19 - 62.26)		
				IDUSROTATI04	X	SM	(62.64 - 62.71)	(62.65 - 62.67)	
				IDUNRT30SM07	X	SM	(64.29 - 64.57)	(64.29 - 64.57)	HIGH DN, 2 MP
N10202557118.2	2025571.18	2025573.71	(236, 204)	IDUSROTATI04	X	SM	(71.18 - 71.25)	(71.18 - 71.25)	
				IDUSROTATI04	0	SM	(72.19 - 72.26)		
				IDUSROTATI04	X	SM	(73.20 - 73.27)	(73.22 - 73.27)	
				IDUSROTATI04	X	SM	(73.64 - 73.71)	(73.64 - 73.64)	
N10202558319.2	2025583.19	2025587.60	(406, 348)	IDUSROTATI04	X	SM	(83.19 - 83.26)	(83.20 - 83.25)	
				IDUSROTATI04	X	SM	(84.19 - 84.25)	(84.19 - 84.25)	
				IDUSROTATI04	X	SM	(85.19 - 85.25)	(85.19 - 85.25)	
				IDUSROTATI04	X	SM	(85.64 - 85.71)	(85.64 - 85.71)	
				IDUNRT30SM08	X	SM	(87.33 - 87.60)	(87.33 - 87.60)	HIGH DN, 3 MP
N10202559419.2	2025594.19	2025594.25	(7, 0)	IDUSROTATI04	X	SM	(94.19 - 94.25)	(94.19 - 94.25)	HIGH DN, 2 MP
N10202560511.2	2025605.11	2025613.59	(777, 392)	IDUSFINROT01	X	LM	(05.11 - 05.25)	(05.11 - 05.24)	HIGH DN, 5 MP
				IDUSFINROT01	X	LM	(06.10 - 06.26)	(06.11 - 06.26)	HIGH DN, 5 MP
				IDUSFINROT01	X	LM	(07.14 - 07.23)	(07.14 - 07.23)	HIGH DN, 5 MP
				IDUSFINROT01	X	LM	(07.56 - 07.69)	(07.56 - 07.69)	HIGH DN, 5 MP
				IDUNIDAFIN01	M	LM	(09.06 - 09.85)	(09.52 - 09.85)	LOW DN, MP 6,7
				IDUNIDAFIN01	X	LM	(09.86 - 11.82)	(09.86 - 11.81)	HIGH DN, 6 MP

NIMS IDA DATA

NIMS_EDR	SCLK 1	SCLK2	(NR, NF)	OAPEL	IDA	MODE	DATA_RANGE	IDA_RANGE	COMMENTS
				IDUS6COLOR01	X	LM	(12.80 - 12.85)	(12.80 - 12.85)	HIGH DN, 5 MP
				IDUS6COLOR01	X	LM	(13.16 - 13.20)	(13.16 - 13.20)	HIGH DN, 5 MP
				IDUS6COLOR01	X	LM	(13.28 - 13.33)	(13.28 - 13.33)	HIGH DN, 5 MP
				IDUS6COLOR01	X	LM	(13.41 - 13.46)	(13.41 - 13.46)	HIGH DN, 5 MP
				IDUS6COLOR01	X	LM	(13.54 - 13.59)	(13.54 - 13.59)	HIGH DN, 5 MP
N10202561585.2	2025615.85	2025627.27	(1035, 486)	IDUS6COLOR01	0	LM	(15.85 - 15.89)		
				IDUNIDACHM01	M	SM	(16.57 - 16.77)	(16.72 - 16.77)	LOW DN, MP 0,1
				IDUNIDACHM01	X	SM	(17.04 - 18.16)	(17.11 - 18.13)	HIGH DN
				IDUNIDACHM01	M	SM	(18.82 - 18.88)	(18.84 - 18.88)	LOW DN, MP 19
				IDUNIDACHM01	X	SM	(19.25 - 20.52)	(19.29 - 20.52)	HIGH DN
				IDUSHIRES_01	M	XM	(22.74 - 22.77)	(22.75 - 22.75)	LOW DN, MP 6,7
				IDUSHIRES_01	0	XM	(22.82 - 22.84)		
				IDUSHIRES_01	X	XM	(23.02 - 23.25)	(23.02 - 23.23)	HIGH DN
				IDUSHIRES_01	X	XM	(23.29 - 23.51)	(23.30 - 23.43)	HIGH DN
				IDUSHIRES_01	X	XM	(24.28 - 24.52)	(24.34 - 24.44)	HIGH DN
				IDUSENCNTR01	X	XM	(27.80 - 27.90)	(27.84 - 27.86)	HIGH DN
N10202565854.2	2025658.54	2025660.16	(145, 1)	IDUNBORCAL01	STAR	XM	(58.54 - 60.16)		
N10202628981.2	2025689.81	2025691.04	(106, 0)	IDUNPCTCAL01	PCT	LM	(89.81 - 91.04)		
N10202861974.2	2025619.74	2025621.07	(116, 0)	IDUNRCTCAL01	RCT	FM	(19.74 - 21.07)		

JET PROPULSION LABORATORY   IOM NIMS 94-xxx-FL

21-JUL-1994

To: Bill Smythe

From: Frank Leader (UCLA)

Subject: A Brief Discussion of Scan Platform Anomalous Behavior During the IDA Fly-by.

CC: Galileo SDT.

Due to the overheating of the scan platform gyroes, AACS switched from Inertial Mode to Cruise Mode near -230 rims before closest approach to IDA near the start of the Rotation_2 segment. In Cruise Mode, the scan platform was not able to perform mosaics as expected in Inertial mode. Sometimes the mosaics were executed with slight deviations from the predicted mosaic, sometimes with large offsets in execution (time lags up to 30 mfs) and sometimes not at all. This erratic behavior made it very difficult for the NIMS team to predict where IDA would be in a particular mosaic, causing the NIMS Team to miss a large number of opportunities to return NIMS observations of IDA due to the limited number of bits-to-ground available for the IDA data return. The following is a sample of some of the scan platform anomalies observed during the IDA Fly-by. The observed scan platform pointing values come from AACS in the NIMS EDR and the predicts come from TISIM files produced by Pointer. These data are also available in the form of C-Kernels available from the Galileo SDT.

Figures 1 and 2 illustrate one of the occasions when a mosaic was not executed at all. Both planned (thick line) and measured Scan Platform RA (PRA) are plotted as a function of time for two nearly identical NIMS CSMOS mosaics. Figure 1 illustrates a mosaic executed when the spacecraft was still in Inertial Mode at the start of Rotation_1 and Figure 2 is from a mosaic executed at the start of Rotation_4 when the spacecraft was in Cruise Mode. In each case the scan platform was to slew about 4 mrad at a rate of .75 mrad/sec, completing the slew in 8 mf (5 1/3 seconds). In Figure 1 the slew completed in the alotted time and NIMS 'saw' IDA at mf 8; within the error ellipse of the model. In Figure 2 the scan platform did not complete the slew in the allotted time and NIMS failed to 'see' IDA.

Figure 3 illustrates an example of when a mosaic executed in Cruise Mode but was offset in time up to about 30 mfs (20 seconds). The thick line is the planned slew and the thin line is the observed slew. In this mosaic, the scan platform did not slew to the commanded position of -167.7 degrees in PRA prior to the start of the mosaic but remained stationary at the pre-commanded PRA of -167.6 degrees. The scan platform did not move until about 10 mf into the mosaic and then slewed at the commanded slew rate, causing an effective time-offset in the mosaic of about 30 mfs. Fortunately the slew crossed IDA and NIMS was able to return some useful data for this specific observation. Unfortunately, due to 30 mf time-offset in execution, the NIMS Team wasted many DMS-MROs in locating the mfs when NIMS 'saw' IDA.

Figure 4 illustrates the scan platform behavior in a larger mosaic towards the end of the Fly-By (IDUNIDACHM01) where the scan platform deviated from the planned motion but not too greatly. Here the smooth continuous line is the planned mosaic and the wavy dis-continuous line is the observed mosaic. Scan platform RA (PRA) is plotted versus scan platform DEC (PDEC). In the observed mosaic the scan platform seems to have built up an error and then corrected to where it should be in the planned mosaic. The number 1 in the figure shows where the scan platform jumped abruptly in time executing one of these corrections. This jump in scan platform PRA was evident in the NIMS data as NIMS was observing IDA at the time, and made it impossible for the NIMS Team to register the NIMS spectra on IDA.

With the spacecraft in Cruise Mode, the scan platform cone controller (SAS) seems to have been slow to respond to cone slew commands typically used in CSMOS mosaics. The deviation of the cone slew from planned is not uniform for all CSMOS mosaics. Sometimes the slew would cross IDA before the end of the slew and NIMS would 'see' IDA, but at a time much later than that predicted.

Unfortunately there was little support from the AACS Team in helping to understand the erratic behavior of the scan platform in Cruise Mode in time to come up with a plan to return as much NIMS observations of IDA as possible. The only consolation received was the statement that "Cruise Mode was not meant for taking Science Data."

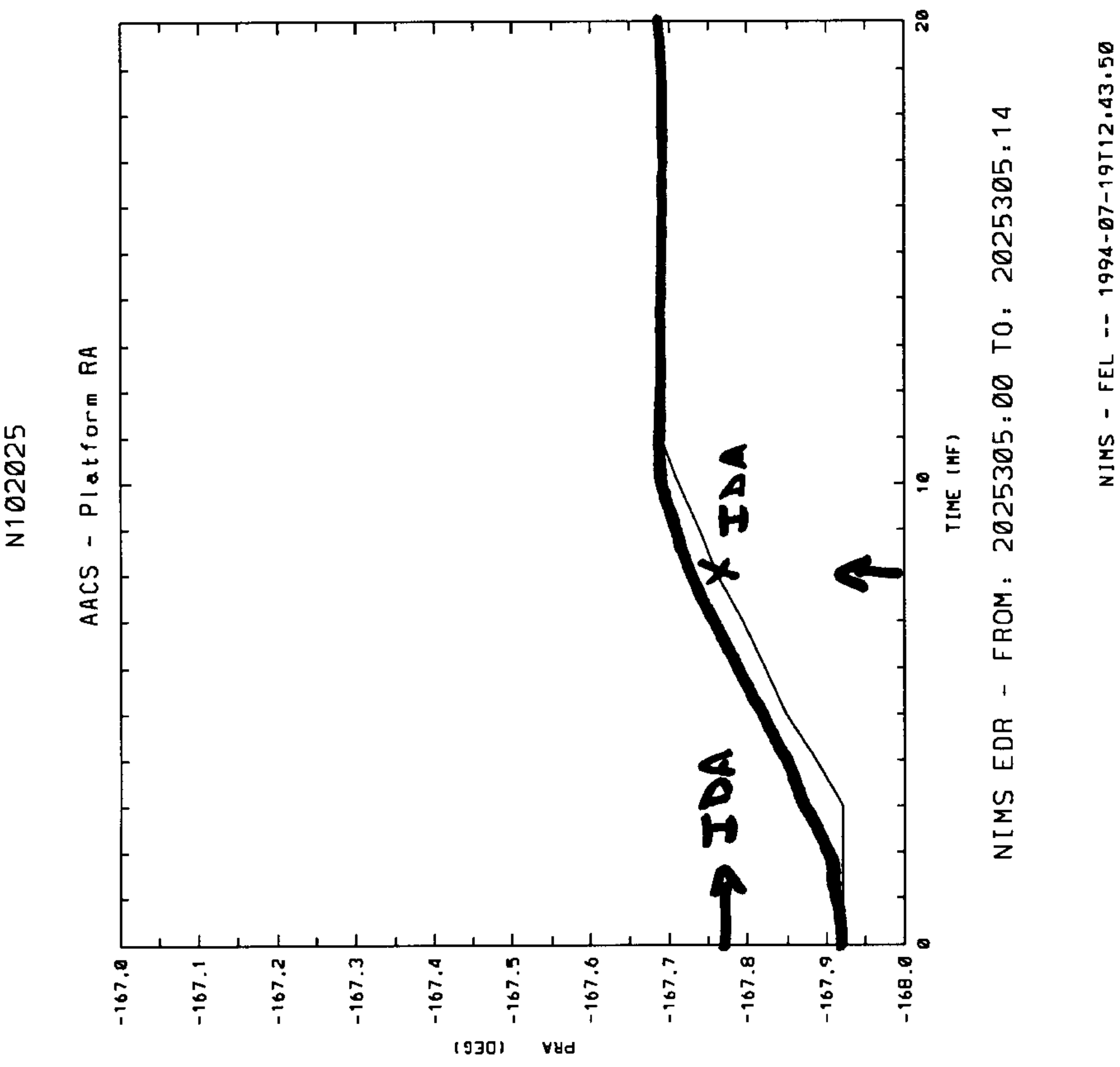
N1Ø2Ø25
AACS - Platform RA
NIMS EDR - FROM: 2025305:00 TO: 2025305:14
NIMS - FEL -- 1994-07-19T12:43:50
TIME (MF)
PRA (DEG)
IDA
IDA

Figure 1

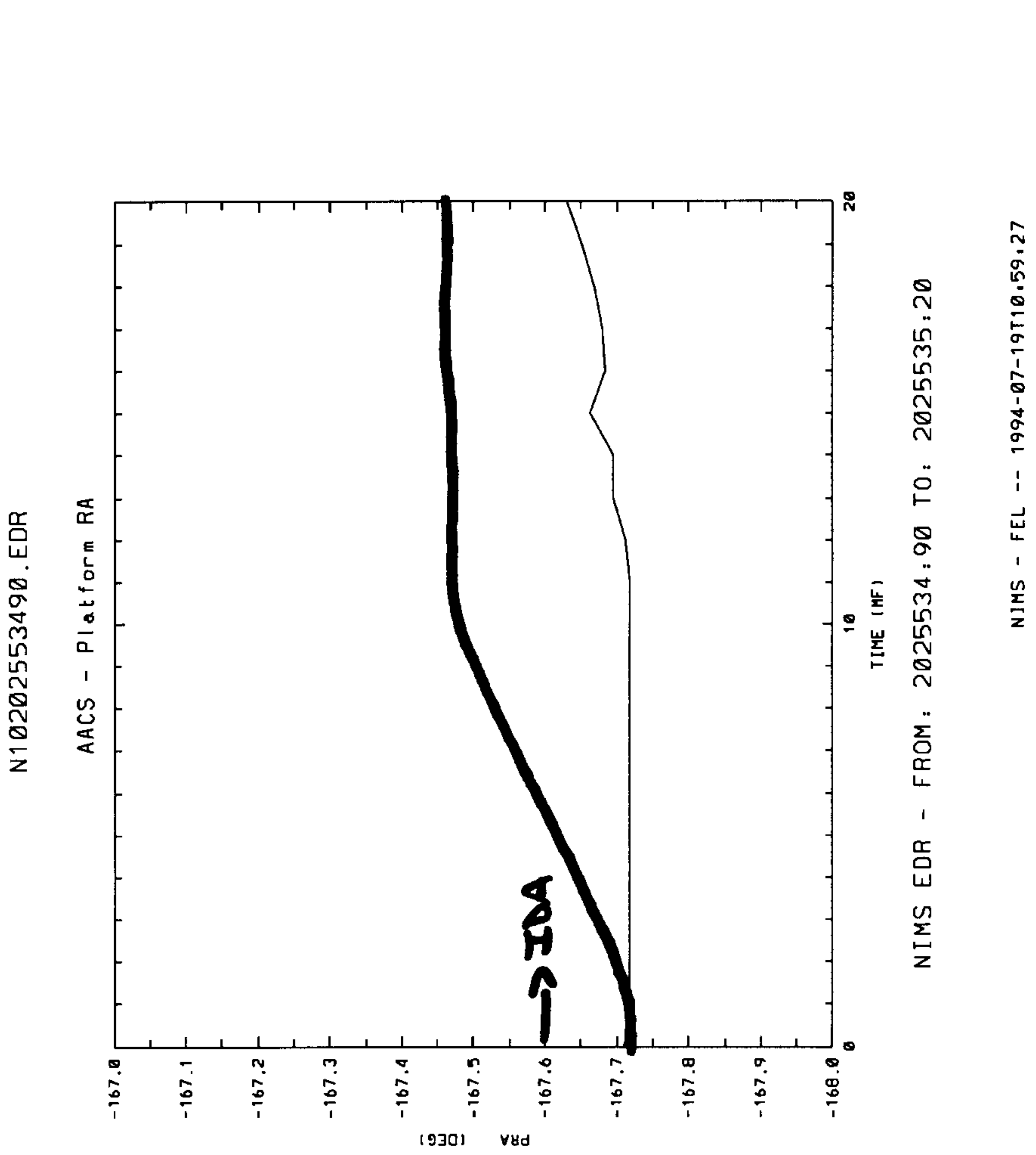
N10202553490.EDR
AACS - Platform RA
-167.0
-167.1
-167.2
-167.3
-167.4
-167.5
-167.6
-167.7
-167.8
-167.9
-168.0
PRA (DEG)
0
10
20
TIME (MF)
IDA
NIMS EDR - FROM: 2025534:90 TO: 2025535:20
NIMS - FEL -- 1994-07-19T10:59:27

Figure 2

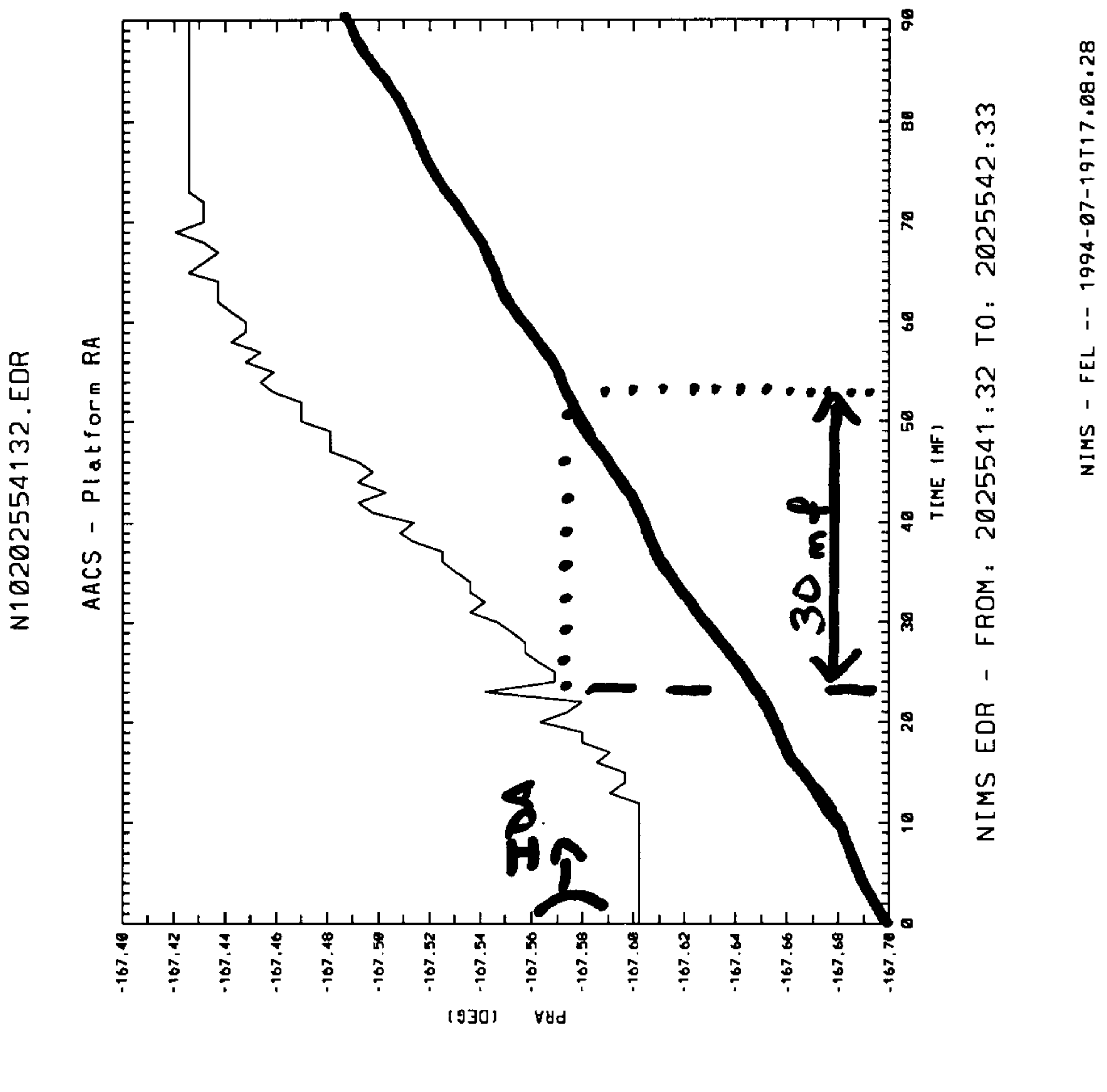
N1Ø2Ø2554132.EDR
AACS - Platform RA
PRA (DEG)
-167.40
-167.42
-167.44
-167.46
-167.48
-167.50
-167.52
-167.54
-167.56
-167.58
-167.60
-167.62
-167.64
-167.66
-167.68
-167.70
0
10
20
30
40
50
60
70
80
90
TIME (MF)
30 mf
NIMS EDR - FROM: 2Ø25541:32 TO: 2Ø25542:33
NIMS - FEL -- 1994-Ø7-19T17:Ø8:28

Figure 3

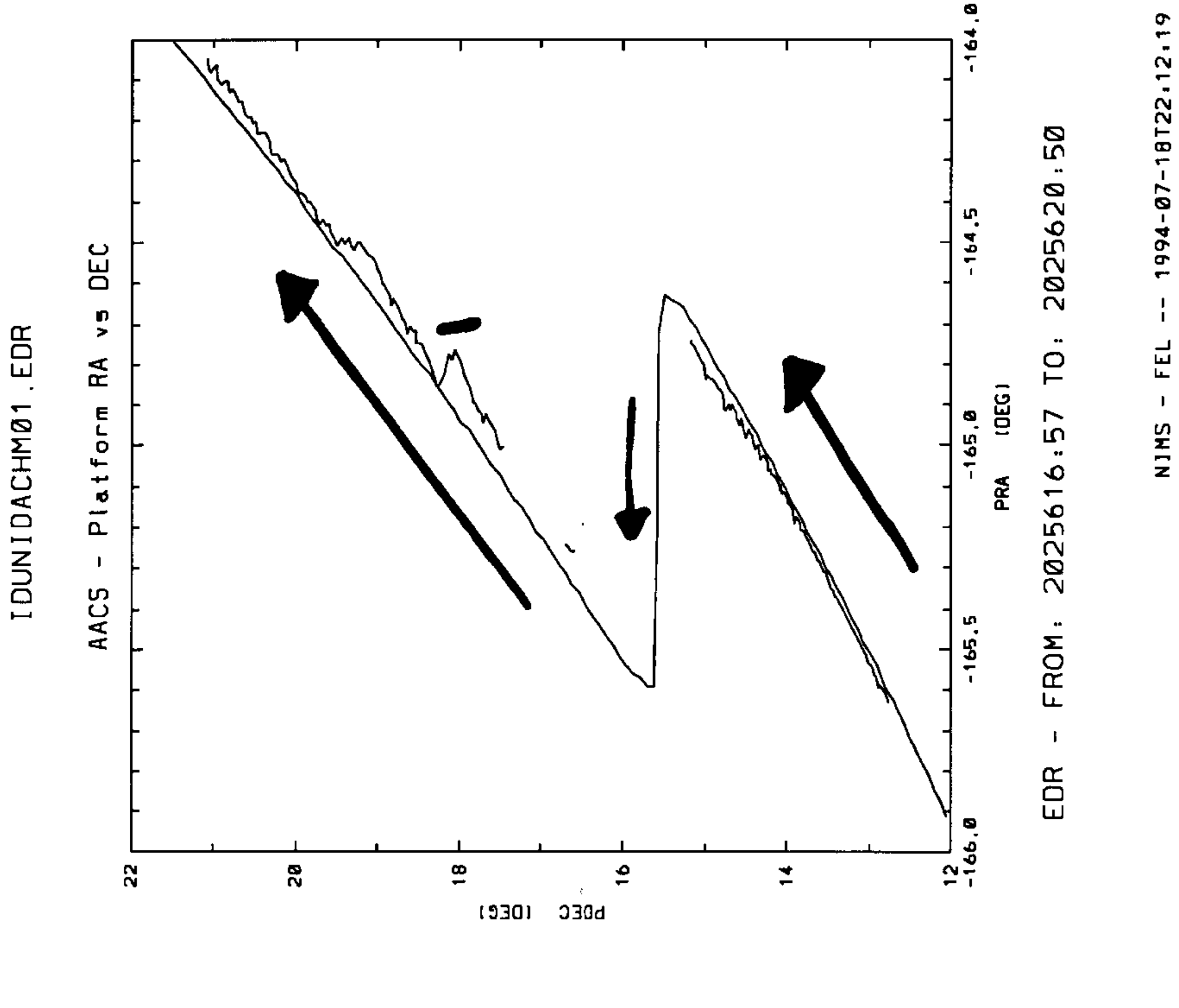
IDUNIDACHM01.EDR
AACS - Platform RA vs DEC
PRA (DEG)
PDEC (DEG)
-164.0
-164.5
-165.0
-165.5
-166.0
22
20
18
16
14
12
EDR - FROM: 2025616:57 TO: 2025620:50
NIMS - FEL -- 1994-07-18T22:12:19

Figure 4