+ Annexes

SUBJECT : JEM-X FM 1 DRB

PLACE : ESTEC

DATE : 25-09-2001

AGENDA : Annex 0.

Participant	Organisation	Function
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S. Laursen		
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AGREEMENTS	ACTIONS
DRB agenda following the INTEGRAL Project Instrument Acceptance Plan, INT-TN-25144 see Annex 0. **1. Items being delivered** All deliveries are defined in the EIDP under shipping document. The EGSE will be returned to DSRI after completion of electrical integration. The EGSE will be redelivered in case of need for off-line investigation. **2. Configuration Status.** **2.1 CIDL (H/W)** **As build configuration:** • As build configuration defines the serial numbers for each board. This is the key to access the lower level Manufacturing Process Sheets (MPS), which defines parts, manufacturing details and verification details for each board. DSRI will collect all the MPS in a specific file. The MPS will be complemented with photos of each sub-assembly for FM-2 and FS. • All design changes have been included in the "As build configuration". **Pending Change Requests:** • JEM-X-ECR-50 is OPEN. This change request reflects the actual build status of the FM-1 and will cover the changes in EID-B, issue 5.2 to 5.4. **RFW's:** • There are no open RFW's. **2.2 CIDL (S/W)** **As build configuration (see CIDL summary for details in EIDP):** **DPE:** • DPE IASW: version 1.61 to be used with CSSW 1.9b. IASW is specified in IASW SSD (specification document) version 1.16. • DPE Memory load cmd. K70, 71, 72, 73, setting the X-position linearisation table. This content of this command will be included in the EIDP. • The content of this command is likely to be updated in-orbit based on the calibration. • The interfaces between DFEE and DPE SW is defined in the User Manual and the IASW SSD (specification document) version 1.16. • The DPE IASW including all supporting documents as defined SCI-PG/1.6/PSt/4890/ap will be included in the EIDP. The IASW code is delivered on disk separately and will be used for the ISST.	AI#01, DSRI 25.10.2001 AI#02, DSRI, 4.10.2001 AI#03, DSRI 4.10.2001

AGREEMENTS	ACTIONS
DFEE: • DFEE SW: version 4.0 • DFEE SW patches, (3 individual patches), The content of these commands will be defined in the EIDP. • One memory load cmd. The content of this command will be defined and included in the EIDP. • The DFEE SW (6 blocks) will be provided as a single image according to OBSMS-SGS ICD:ICD INT-MOC-ICD-0003 and added to the EIDP: • The DFEE SW Summary, EIDP section 9, will include a definition of the location of the different type of codes. • The DFEE SW spec. document is under update and will be included in the EIDP The patches are fully verified. **3. Completion and results of test programme** **3.1 Mechanical Interfaces** • Dimensional control measurements related to all the interfaces will be provided and added to the EIDP. • Physical properties (mass, CoG) was measured. DSRI will provide the measurement report and add it to the EIDP. **3.1.1 Alignment** Most important parameter is stability on satellite. On ground and in flight calibration will give information relevant to alignment. No optical measurement has been done on JEM-X FM1 only position of MS plate w.r.t. collimator has been measured. No informations are provided in the EIDP on alignment measurements. DSRI will provide a report on performed measurement and state if alignment data required in the EID-B need to be verified or not. If alignment data on detector are not available the sides of the cubes will be considered parallel to the functional frame of the detector and the target on the collimator will be considered exactly the origin of the functional frame. DSRI will assess the acceptability of this approach. **3.1.2 Ground stud connection** Fixation torque shall be max. 2.0 Nm, see MICD. **3.2 Thermal I/F** Ref. to MICD JEM-X-130100 rev D. There are no heaters on the detector. **3.3 Power I/F** EID-A requirements 4.4.2.1, 4.4.2.2, 4.4.3.1. and 4.4.4 were verified, see as run test procedure IN-TP-JEM-0012. Actual value of power consumption (BOL) is in operation mode 29.9 W.	AI#04a, DSRI 4.10.2001 AI#04b, DSRI 15.11.2001 AI#05, DSRI 4.10.2001 AI#06, DSRI 4.10.2001

AGREEMENTS	ACTIONS
3.4 Data Handling I/F EID-A requirement 4.5.2.3 verified, see as run test procedure above.	
3.5 EMC As run test procedure IN-TP-JEM-0002 and facility test report will be added to the EIDP.	AI#07, DSRI 15.10.2001
3.6 Functional Functional tests performed as per as run test procedure INT-TP-JEM-0011.	
4. NCRs	
4.1 DSRI-Metorex NCRs Complete list of NCRs applicable to FM1 is in the EIDP (from DSRI and Metorex). The following NCR's are still open.	
IN-NC-JM-1040 : EMC, common mode susceptibility. CPU reset. Use as is on FM1, investigation on QM unit planned.	AI: DSRI
IN-NC-JM-1041 : TV, detector gain reduction (factor of two) in extreme cold and extreme hot. Calibration campaign showed no gain change before and after TV (in ambient condition). No theoretical explanation available yet. No further investigation on FM1 foreseen. Effect of temperature on gain will be further measured during FM2 TV test. User Manual must reflect temperature dependence	AI#08, DSRI 15.11.2001
IN-NC-JM-1042 : Non linearity of 4 and 14 back-plane preamplifiers. Range of non-linearity is for source beyond 60 keV. It is still unclear if it is a pre amplifier or electronic calibration problem. Results of further investigation performed during calibration at Ferrara (non conclusive) will be attached to the NCR. No further investigation foreseen on FM1.	
A further NCR shall be raised on high voltage discharge occurring on the initial power up of FM1 detector connected to the QM DFEE	AI: DSRI 4.10.2001
4.2 Alenia NCRs All class B NCRs are closed (see list in ANNEX 1) except INT-AI-B-0292 which will stay open up to opening of the EM detector for investigation.	
Class C NCRs still open (see list in ANNEX 2): INT-AI-C-0207 : UM to be updated. New tele-command to be added.	AI#09, DSRI 4.10.2001
INT-AI-C-0208 : Change page to UM, page 168, para 6.1.13 delivered during the DRB. NCR considered closed, (see annex 3) update already included in UM, issue 4.3	

AGREEMENTS	ACTIONS
INT-AI-C-0212 : FM1 to be tested during ISST at ESTEC	AI: Alenia
INT-AI-C-0218 : Alenia to updated the User Manual	AI: Alenia
INT-AI-C-0219 : UM page 185, para 6.4.6 update is delivered during the DRB, (see annex 3). NCR is considered closed. The change pages to UM quoted above are in ANNEX 3 and are already included in the UM.	
5. Open or deferred work	
EID-B update to issue 5.4	AI#10, DSRI 4.10.2001
Update of User Manual: • 4st. October: including all patch commands, memory load commands.	AI#11, DSRI 4.10.2001
• 15 November final delivery.	AI#12, DSRI 14.11.2001
6. Temporary removals or installation / Non flight items - Protection cover mounted on the collimator (red tag item) - Covers (2) on the two optical cubes - Five connector savers	
7. Residuals hazards and safety procedures including radioactive sources. - Four calibration sources (50 microcurie each) are mounted permanently on the collimator Cd109. See datasheet in section 14 of EIDP. - No residual hazard, no additional safety issues. The JEM-X is not considered a pressure vessel.	
8. Packaging, storing, transport and handling procedure Covered by chapter 4 of the EIDP. Manual lifting only is applicable.	
9. Integration procedures, operations and maintenance manual, DataBase Alenia integration procedures are applicable (mechanical and electrical). User Manual (issue 4.3) included in the EIDP in section 6. Update of UM required in particular relevant to commissioning and contingency procedures. No life critical item data need to be recorded during satellite test.	

AGREEMENTS	ACTIONS
DataBase in EIDP is version 2.7. New input to database (including e.g. memory load commands, verified calibration curves, etc. discussed previously) shall be available at Alenia in time for the ISST.	AI#13, DSRI 4.10.2001
ESTEC will clarify whether the patch commands and memory load commands shall be included in the SDB.	AI#14, ESTEC 27.09.2001
10. Availability and completeness of EIDP	
The EIDP for JEM-X FM1 is available (one copy only, the original). It shall be completed as required above in this MoM. A change record shall be included at the beginning and kept up to date. In particular the following shall also be added: - Completed verification matrix (see annex 6) will be added in section 6 of EIDP - Mechanical MICD verification performed by DSRI - EMC tests report - Mechanical vibration test report (with the significant selection of vibration plots) - Thermal test report and TMM correlation report - Calibration test report - copy of the major DSRI/Metorex NCRs applicable for FM1 - minutes of the DRB	
Updated EIDP shall be delivered in three copies.	AI#15, DSRI 4.10.2001
11. Inspection of hardware to be delivered	
See report in annex 4	
12. Status of shipping preparation and schedule	
Instrument has been shipped to ESTEC.	
13. Bench level testing @ ESTEC.	
The following test modules were successfully executed. see annex 5 for detailed test results. • electronic calibration • background test incl. activation of HV to nominal gain	
14. Conclusion	
The DRB is considered successful pending agreed updates of the EIDP.	

Annex O

JEM-X FM1 DRB: agenda

1. Item(s) being delivered (including any protection devices and transport containers)
2. Configuration status
   - CIDL (as design /as built, H/W and S/W)
   - Pending Change Requests
   - RFWs
3. Completion and results of test programme
4. NCRs
5. Open or deferred work
6. Temporary removals or installations
7. Residual hazards and safety procedures including radioactive sources
8. Packaging, storing transport and handling procedures
9. Integration procedures, operations and maintenance manual, DataBase.
10. Availabilty and completeness of EIDP
11. Inspection of hardware to be delivered
12. Status of shipping preparations and schedule
13. ~~Authorization to ship.~~ Bench level testing @ ESTEC
14. Conclusions

The INTEGRAL document "Instrument Acceptance Plan", INT-TN-25144, will be used as guideline for the acceptance.

INTEGRAL E.M. - Non-Conformance Status List

EIDP Nr. INT-ED-AI-0005 - SECTION 9

NCR-No.	Assy	Unit	Mod.	W.I.	Title	Action	Lev	Origin Date	Customer Close Out Ref.	Close Date	Status	Remarks
INT-AI-B-0089	PLM	JEM	EM	N/A	EVIDENCE OF RED COLOR ON SHOCK INDICATOR	PERFORMED	MAJ	18/01/99	04-02-99	02/02/99	CLOSED	
INT-AI-B-0090	PLM	JEM	EM	2080.1	JEM-X NEW PIN FUNCTION	PERFORMED	MAJ	18/01/98	08-11-00	03/11/00	CLOSED	
INT-AI-B-0094	PLM	JEM	EM	2080.1	PIN NOT CONNECTED	PERFORMED	MAJ	20/01/99	30-06-99	18/06/99	CLOSED	
INT-AI-B-0095	PLM	JEM	EM	2080.1	"HV OFF" NOT IMPLEMENTED	PERFORMED	MAJ	20/01/99	23-02-00	10/02/00	CLOSED	
INT-AI-B-0096	PLM	JEM	EM	2080.1	DATA BASE PROBLEM ON JEMX	PERFORMED	min	20/01/99		18/06/99	CLOSED	
INT-AI-B-0099	PLM	JEM	EM	2080.1	INRUSH CURRENT TIMING	PERFORMED	min	19/01/99		15/03/99	CLOSED	
INT-AI-B-0100	PLM	JEM	EM	2080.1	THERMISTOR AND PRESSURE MONITOR MISSING	PERFORMED	MAJ	20/01/99	04-05-00	09/03/00	CLOSED	
INT-AI-B-0101	PLM	JEM	EM	2080.1	THERMISTOR MISSING	PERFORMED	MAJ	19/01/99	22-11-99	18/06/99	CLOSED	
INT-AI-B-0102	PLM	JEM	EM	2080.2	DATA BASE PROBLEM ON JEM-X	PERFORMED	MAJ	20/01/99	30-06-99	18/06/99	CLOSED	
INT-AI-B-0103	PLM	JEM	EM	2080.2	BROADCAST PKT TELEMETRY REPORT ANOMALY	PERFORMED	MAJ	20/01/99	04-05-00	09/03/00	CLOSED	
INT-AI-B-0138	PLM	JEM	EM	2080.2	NON LINEARITY OF THE HIGH VOLTAGE VALVES	PERFORMED	MAJ	02/03/99	30-06-99	18/06/99	CLOSED	
INT-AI-B-0212	PLM	JEM	EM	2225.2	HS LINK DATA OUT OF RANGE	PERFORMED	MAJ	08/06/99	10/07/01	06/07/01	CLOSED	
INT-AI-B-0213	PLM	JEM	EM	2225.3	AUTOMATIC TRANSITION FROM CALIBRATION MODE	PERFORMED	MAJ	11/06/99	08-11-00	02/10/00	CLOSED	
INT-AI-B-0214	PLM	JEM	EM	2225.3	IMAGING FORMATS WITH INVERTED APID	PERFORMED	MAJ	11/06/99	04-05-00	09/03/00	CLOSED	
INT-AI-B-0215	PLM	JEM	EM	2225.3	AUTOMATIC TRANSITION FROM DIAGNOSTIC DUMP MODE	PERFORMED	MAJ	11/06/99	04-05-00	09/03/00	CLOSED	

3 pages

NCR-No.	Assy	Unit	Mod.	W.I.	Title	Action	Lev	Origin Date	Customer Close Out Ref.	Close Date	Status	Remarks
INT-AI-B-0229	PLM	JEM	EM	2225.3	TELECOMMANDS SEND TWICE	PERFORMED	MAJ	15/06/99	18-01-00	10/09/99	CLOSED	
INT-AI-B-0230	PLM	JEM	EM	2225.3	SUPER USER PRIVILEDGES COMMANDS	PERFORMED	MAJ	15/06/99	18-01-00	10/09/99	CLOSED	
INT-AI-B-0231	PLM	JEM	EM	2225.3	DATA BASE DISCREPANCIES	PERFORMED	MAJ	15/06/99	23-02-00	10/02/00	CLOSED	
INT-AI-B-0234	PLM	JEM	EM	2225.3	DATA TAKING MODE TO SETUP	PERFORMED	MAJ	22/06/99	23-02-00	10/02/00	CLOSED	
INT-AI-B-0236	PLM	JEM	EM	2232.6	TIME OUT OCCURRED DURING DATA TAKING	PERFORMED	MAJ	23/06/99	23-02-00	10/02/00	CLOSED	
INT-AI-B-0237	PLM	JEM	EM	2232.6	TYPE AND SUBTYPE LOCATION	PERFORMED	MAJ	23/06/99	04-05-00	09/03/00	CLOSED	
INT-AI-B-0245	PLM	JEM	EM	2232.6	OEM AFTER EXIT FROM ECLYPSE	PERFORMED	MAJ	25/06/99	23-02-00	10/02/00	CLOSED	
INT-AI-B-0248	PLM	JEM	EM	2232.6	OEM WHEN JEM-X IS IN DATA TAKING	PERFORMED	MAJ	26/06/99	04-05-00	09/03/00	CLOSED	
INT-AI-B-0284	PLM	JEM	EM	2233.1	34 ADC READ-OUTS SET TO A LOW VALUE	PERFORMED	MAJ	22/07/99	23-02-00	10/02/00	CLOSED	
INT-AI-B-0292	PLM	JEM	EM	068	HIGHER AMOUNT OF EVENTS (DFEE S/W)	PERFORMED	MAJ	02/02/00	16/08/01	16/08/01	CLOSED	
INT-AI-B-0293	PLM	JEM	EM	068	LOST OF TRIGGER INITIALISATION	PERFORMED	MAJ	02/02/00	21-06-00	20/06/00	CLOSED	
INT-AI-B-0294	PLM	JEM	EM	068	BLANK HK PACKET DURING TRANSITION FROM SAFE TO SETUP	PERFORMED	MAJ	04/02/00	08-11-00	02/11/00	CLOSED	
INT-AI-B-0295	PLM	JEM	EM	068	BCPKT ANOMALY: NO RECOVERY AFTER ECLIPSE WITH DFEE OFF	PERFORMED	MAJ	04/02/00	08-11-00	02/11/00	CLOSED	
INT-AI-B-0296	PLM	JEM	EM	068	DATABASE DISCREPANCES	PERFORMED	MAJ	07/02/00	10/07/01	09/07/01	CLOSED	

NCR-No.	Assy	Unit	Mod.	W.I.	Title	Action	Lev	Origin Date	Customer Close Out Ref.	Close Date	Status	Remarks
INT-AI-B-0297	PLM	JEM	EM	049	TM PACKET AS41 (GREY FILTER PARAMETER) IS WRONG	PERFORMED	MAJ	29/02/00	21-06-00	20/06/00	CLOSED	
INT-AI-B-0298	PLM	JEM	EM	049	WRONG HEADER ON THE ON-REQUEST TM PACKETS	PERFORMED	MAJ	29/02/00	21-06-00	20/06/00	CLOSED	
INT-AI-B-0299	PLM	JEM	EM	049	ENERGY LINEARIZATION TABLE SETTING	PERFORMED	MAJ	29/02/00	21-06-00	20/06/00	CLOSED	
INT-AI-B-0300	PLM	JEM	EM	049	JEM-X DB DISCREPANCES (DBN 1188)	PERFORMED	MAJ	03/03/00	10/07/01	09/07/01	CLOSED	

INTEGRAL P.F.M. - Non-Conformance Status List

SECTION 9

NCR-No.	Assy	Unit	Mod.	W.I.	Title	Action	Lev	Origin Date	Customer Close Out Ref.	Close Date	Status	Remarks
INT-AI-C-0172	PLM	JEMX	EM	3270.5	JEM-X DETECTOR POSITION	PERFORMED	MAJ	07/11/00	14-05-01	14/05/01	CLOSED	
INT-AI-C-0178	PLM	JEMX	EM	3270.5	DPE HV COMMAND OFF DFEE	PERFORMED	MAJ	07/11/00	14-05-01	14/05/01	CLOSED	
INT-AI-C-0179	PLM	JEMX	EM	3270.7	HANG-UP DURING DATA TAKING	PERFORMED	MAJ	14/11/00	14-05-01	14/05/01	CLOSED	
INT-AI-C-0180	PLM	JEMX	EM	3270.7	OEM GENERATION	PERFORMED	MAJ	14/11/00	10/07/01	02/07/01	CLOSED	SVTC318/343/3
INT-AI-C-0181	PLM	JEMX	EM	3270.7	CPU SWITCHING TO 16 MHZ	PERFORMED	MAJ	14/11/00	14-05-01	14/05/01	CLOSED	SVTC-PR-0360
INT-AI-C-0182	PLM	JEMX	EM	3270.7	DIFFERENT SW VERSION	PERFORMED	MAJ	14/11/00	04/09/01	04/09/01	CLOSED	
INT-AI-C-0183	PLM	JEMX	EM	3270.7	GREY FILTER FUNCTIONALITY MISSING	PERFORMED	MAJ	14/11/00	14-05-01	14/05/01	CLOSED	
INT-AI-C-0206	PLM	JEMX	EM	3270.10	DETECTOR TEMPERATURE ERROR FLAG SETTING	PERFORMED	MAJ	16/02/01	14-05-01	14/05/01	CLOSED	SVTC-PR-0350
INT-AI-C-0207	PLM	JEMX	EM	3270.10	DETECTOR PRESSURE LEVELS	DSRI TO UPDATE IASW CODE	MAJ	16/02/01			OPEN	SVTC-PR-035
INT-AI-C-0208	PLM	JEMX	EM	3270.10	UN IMPROVEMENT ON LINEARIZATION TABLE VERIFICATION	DSRI TO UPDATE UM	MAJ	16/02/00			OPEN	SVTC-PR-034
INT-AI-C-0209	PLM	JEMX	EM	3270.10	UNEXPECTED BEHAVIOUR AFTERN EXIT FROM DIAG. AND CALIB. MODES	PERFORMED	MAJ	16/02/01	08/08/01	08/08/01	CLOSED	SVTC-PR-340
INT-AI-C-0210	PLM	JEMX	EM	3270.10	AUTONOMOUS RECOVERY FUNCTION RESTORES UNEXPECTED LEVELS OF HV	PERFORMED	MAJ	16/02/01	14-05-01	14/05/01	CLOSED	SVTC-PR-03
INT-AI-C-0211	PLM	JEMX	EM	3270.10	CONTEXT SAVE/RESTORE FUNCTION MISSING	PERFORMED	MAJ	16/02/01	27/06/01	27/06/01	CLOSED	SVTC-PR-03
INT-AI-C-0212	PLM	JEMX	EM	3270.10	DATA BASE DISCREPANCIES FOUND DURING SVT-C	DB TO BE TESTED DURING FM1 ACCEPTANCE CAMPAIGN @ESTEC	MAJ	16/02/01			OPEN	SVTC-PR-

A1

NCR-No.	Assy	Unit	Mod.	W.I.	Title	Action	Lev	Origin Date	Customer Close Out Ref.	Close Date	Status	Remark
INT-AI-C-0216	PLM	JEMX	EM	3270.10	HSL PROBLENS DURING DIAGNOSTIC MODE	PERFORMED	MAJ	16/02/01	10/07/01	06/07/01	CLOSED	SVTC-PR-033
INT-AI-C-0217	PLM	JEMX	EM	3270.10	DFEE REPORT ALWAYS SAME CRC VALUE	PERFORMED	MAJ	16/02/01	14-05-01	14/05/01	CLOSED	SVTC-PR-034
INT-AI-C-0218	PLM	JEMX	EM	3270.10	DATA TAKING TM AND CALIBRATION TM PERFORMANCES	ALENIA TO UPDATE USER MANUAL	MAJ	16/02/01			OPEN	SVTC-PR-344
INT-AI-C-0219	PLM	JEMX	EM	3270.10	USER MANUAL NOT UPDATED	DSRI U.M. PARA 6.4.6 TO BE UPDATED	MAJ	16/02/01			OPEN	SVTC332/336
INT-AI-C-0220	PLM	JEMX	EM	3270.10	CLASS 3 OEM NOT CONFORM TO THE STANDARD	PERFORMED	MAJ	16/02/01	14-05-01	14/05/01	CLOSED	SVTC-PR-035
INT-AI-C-0250	PLM	JEMX	EM	3220.2	WRONG REACTION AFTER THE ECLIPSE EXIT	PERFORMED	MAJ	09/07/01	04/09/01	23/08/01	CLOSED	
INT-AI-C-0276	PLM	JEMX	STM	3350.3	CONNECTOR INTERFERENCE	PERFORMED	min	11/07/01	16/08/01	16/08/01	CLOSED	

6.1.13 JEM-X Energy Conversion Table Setting (Continued)

Proc. Step #	Exec Time	Step Description	TC	TM monitoring	Expected TM value	Remarks
1		Verify DFEE in Setup Mode		Verify DFEE State	K5022=5	
2		Load first energy table segment	K24 ENERGY64			Values for ch 0 to 63
3		Load second energy table segment	K25 ENERGY64			Values for ch 64 to 127
4		Load third energy table segment	K26 ENERGY64			Values for ch 128 to 191
5		Load fourth energy table segment	K27 ENERGY64			Values for ch 192 to 255
6		Expand Energy Table	K35 EXP_ENERGY_LIN			
7		Go to Safe	K8	Verify DFEE State	K5022=1	
8		Go to Memory	K10	Verify DFEE State	K5022=2	
9		Verify DFEE Energy Table (first segment)	K18 DFEE_DUMP TC_PARA: *K27*=255, *K17*=44032, *K18*=64			Compare Values
10		Verify DFEE Energy Table (second segment)	K18 DFEE_DUMP TC_PARA: *K27*=255, *K17*=44196, *K18*=64			Compare Values
11		Verify DFEE Energy Table (third segment)	K18 DFEE_DUMP TC_PARA: *K27*=255, *K17*=44260, *K18*=64			Compare Values
12		Verify DFEE Energy Table (fourth segment)	K18 DFEE_DUMP TC_PARA: *K27*=255, *K17*=44324, *K18*=64			Compare Values
13		Dump expanded table	K18 DFEE_DUMP TC_PARA: *K27*=255, *K17*=57344, *K18*=4096			Offline verification by PI
14		Goto Safe	K8	Verify DFEE State	K5022=1	
15		End of procedure				

6.4.4 Recovery from Imminent Off

In case of Imminent off flag set in the BCPKT, the instrument goes to Safe Mode. and no automatic recovery is foreseen. Therefore a manual procedure is required to return in Data Taking (see also ESAM recovery procedure).
If the imminent switch off flag is followed by the DFEE switch off, the instrument must be switched on again and configured in Safe Mode. Afterwords the DFEE context saved in the DPE Memory has to be restored into the DFEE. The following procedures will be used:

Switch on DFEE and command the instrument in Safe Mode	(K0002)
DFEE Context restoring from DPE Memory	(K0020)
Transition from Safe to Setup Mode	(K0003)
Low level discriminator setting	(K0023)
Modify anode configuration	(K0022)
HV switch on	(K0004)
Set the drift voltage, V_C, to the nominal value	(K0005)
Set the gas gain voltage, dV, to the nominal value minus 2. [4]	(K0006)
Transition to Data Taking Mode	(K0010).
Wait 30 minutes	
Goto Setup Mode	(K0024)
Set the gas gain voltage, dV, to the nominal value	(K0006)
Transition to Data Taking Mode	(K0010).

6.4.5 Recovery from ESAM

In case of ESAM flag set in the BCPKT, the instrument goes to Safe Mode and no automatic recovery is foreseen. Therefore a manual procedure is required to return in Data Taking.
The following procedures will be used:

Transition from Safe to Setup Mode	(K0003)
Low level discriminator setting	(K0023)
Modify anode configuration	(K0022)
HV switch on	(K0004)
HV setting	(K0005)
Transition to Data Taking Mode	(K0010).

6.4.6 The use of the S/C controlled HV OFF function.

A hard wired command is provided which allows the the ground operators to switch off the JEM-X high voltage supplies in contingencies. Normally, the high voltage switch-off will be done by the IASW based on the information in the Broadcast Packet. If this does not happen (a Radiation Monitor malfunction?) the high voltage will be switched off when the background rate in the JEM-X detectors exceed an upper limit. Alternatively, in cases where the mission controllers are unable to verify from the JEM-X telemetry that the high voltage has been switched off, the controllers should use the S/C controlled HV Off command. In both situations the HK-parameter K5584 will be set to 1 to indicate that the high voltage was switched off via the hardware line rather than through the normal command.

[4] When the gas gain voltage is applied to the microstrip the gain will initially be about 30% higher than nominal. This situation is not desirable as it increases the risk of discharges. Therefore the detector is initially switched on at slightly lower voltage, and allowed to stabilize there before setting the final voltage. The data taken during the first 30 minutes may be useable although the detector gain will be varying.

ANNEX 4 Annex 4

ACCEPTANCE DATA SHEET (page 1 of 2)

Item : JEMX-FM1	VISUAL INSPECTION	Doc. No. INT-IMN-3998
Model : FM		

1) **IDENTIFICATION LABEL(S)**

(grooved in) JEM-X FM1
PN 130000-01

2) **GENERAL APPEARANCE** - All screws secured with glue.
-

3) **THERMAL FINISH** (conformance, quality, no surface damage)

- OK
- marks from the fixation of the upper sensor unit to test cover during test. (no impact)
- outgassing holes identified

4) **CONNECTORS** (no damage to case, shell, pins, alignment of pins)

5 connectors inspected. OK

5) **CONNECTOR SAVERS** remounted for bench test!

6) **PROTECTIVE COVERS** (connectors and apertures)

- Protective Cover (Red) on top
- Fixed with 2 screws
- Dimensions Ø 290 thickness 30 mm

ACCEPTANCE DATA SHEET (Page 2 of 2)

Item : JEMX-FM1	VISUAL INSPECTION	Doc. No.
Model : FM		INT-IMN-39989

7) **HARNESSES** (experiment interconnection and test harness)

OK

8) **CLEANLINESS** OK

9) **SAFETY DEVICES** (if applicable)

—

10) **HANDLING PROVISIONS** Delivery !

- M5 special long fixed allan key
- Cargo box for storage and transportation with special fixation adapter included

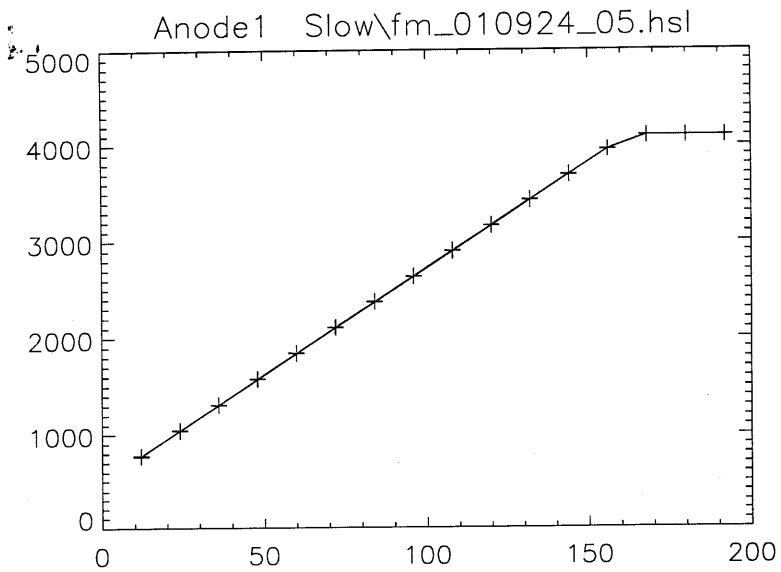
Date : 25.09.01 Name : Est

Alenia :

DSRI :

Type	Date	Time	Event	Comment
	24-09-2001	15:24:43	Start Session	fm_010924_01
	24-09-2001	15:24:51	Power Simulator	Instrument On
	24-09-2001	15:28:53	LSL Command	MEMORY
	24-09-2001	15:29:05	LSL Command	FASTGAIN
	24-09-2001	15:29:15	LSL Command	CHENERGY
	24-09-2001	15:29:22	LSL Command	FSHUP
	24-09-2001	15:29:30	LSL Command	FSHLOW
	24-09-2001	15:29:45	LSL Command	FSSUP
	24-09-2001	15:29:52	LSL Command	FSSLOW
	24-09-2001	15:29:58	LSL Command	CUP
	24-09-2001	15:30:04	LSL Command	CLOW
	24-09-2001	15:30:10	LSL Command	BUP
	24-09-2001	15:30:15	LSL Command	BLOW
	24-09-2001	15:30:24	LSL Command	PATCH1A
	24-09-2001	15:30:29	LSL Command	PATCH1B
	24-09-2001	15:30:33	LSL Command	PATCH1C
	24-09-2001	15:30:38	LSL Command	PATCH1D
	24-09-2001	15:30:43	LSL Command	PATCH2
	24-09-2001	15:30:48	LSL Command	PATCH3A
	24-09-2001	15:30:51	LSL Command	PATCH3B
	24-09-2001	15:30:55	LSL Command	PATCH3C
	24-09-2001	15:31:02	LSL Command	PATCH3D
	24-09-2001	15:31:26	LSL Command	SAFE
	24-09-2001	15:31:44	LSL Command	MEMORY
	24-09-2001	15:31:59	LSL Command	DIAGINF
	24-09-2001	15:32:08	LSL Command	SAFE
	24-09-2001	15:32:14	LSL Command	SETUP
	24-09-2001	15:32:23	LSL Command	DISCR10
	24-09-2001	15:32:29	LSL Command	ANODE1
	24-09-2001	15:32:52	LSL Command	CAL10
	24-09-2001	15:34:22	LSL Command	ANODE2
	24-09-2001	15:34:28	LSL Command	CAL10
	24-09-2001	15:35:33	LSL Command	ANODE3
	24-09-2001	15:35:40	LSL Command	CAL10
	24-09-2001	15:36:55	LSL Command	ANODE4
	24-09-2001	15:37:03	LSL Command	CAL10
	24-09-2001	15:38:16	LSL Command	ANODES
	24-09-2001	15:38:23	Next Session	fm_010924_02
	24-09-2001	15:38:31	LSL Command	MHZ16
	24-09-2001	15:39:03	LSL Command	ENERGY

Type	Date	Time	Event	Comment
[redacted]	24-09-2001	15:39:53	LSL Command	HVRDY
[redacted]	24-09-2001	15:40:07	LSL Command	HVON
[redacted]	24-09-2001	15:40:48	LSL Command	VC70
[redacted]	24-09-2001	15:43:21	LSL Command	DV57
[redacted]	24-09-2001	15:45:07	LSL Command	DIAGNOSTIC
[redacted]	24-09-2001	16:12:32	LSL Command	SETUP
[redacted]	24-09-2001	16:12:40	Next Session	fm_010924_03
[redacted]	24-09-2001	16:12:46	LSL Command	DV59
[redacted]	24-09-2001	16:13:37	LSL Command	DIAGNOSTIC
[redacted]	24-09-2001	17:26:24	LSL Command	SETUP
[redacted]	24-09-2001	17:26:32	Next Session	fm_010924_04
[redacted]	24-09-2001	17:26:56	LSL Command	DATA
[redacted]	24-09-2001	17:39:07	LSL Command	SETUP
[redacted]	24-09-2001	17:39:18	LSL Command	HVOFF
[redacted]	24-09-2001	17:39:27	LSL Command	ANODE1
[redacted]	24-09-2001	17:39:32	LSL Command	CAL10
[redacted]	24-09-2001	17:39:40	Next Session	fm_010924_05
[redacted]	24-09-2001	17:41:30	LSL Command	ANODE2
[redacted]	24-09-2001	17:41:35	LSL Command	CAL10
[redacted]	24-09-2001	17:44:11	LSL Command	ANODE3
[redacted]	24-09-2001	17:44:16	LSL Command	CAL10
[redacted]	24-09-2001	17:47:17	LSL Command	ANODE4
[redacted]	24-09-2001	17:47:21	LSL Command	CAL10
[redacted]	24-09-2001	17:48:45	Next Session	fm_010924_06
[redacted]	24-09-2001	17:51:59	LSL Command	SAFE
[redacted]	24-09-2001	17:52:10	Power Simulator	OFF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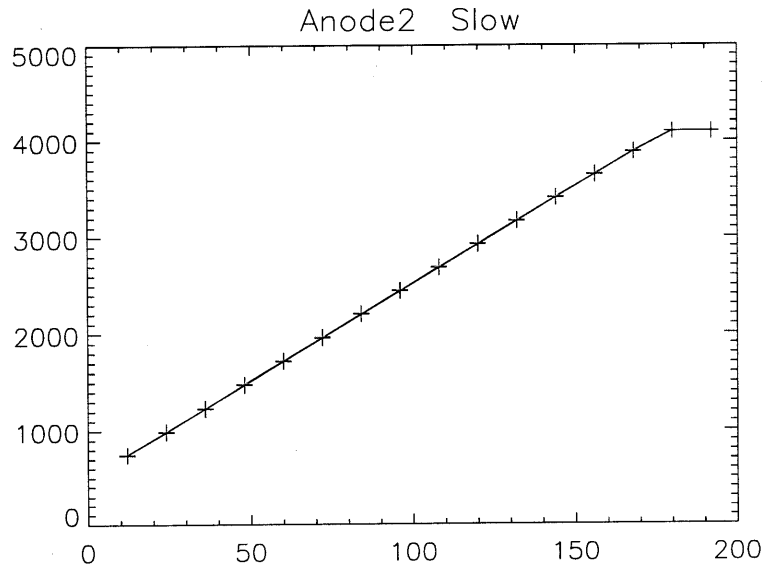
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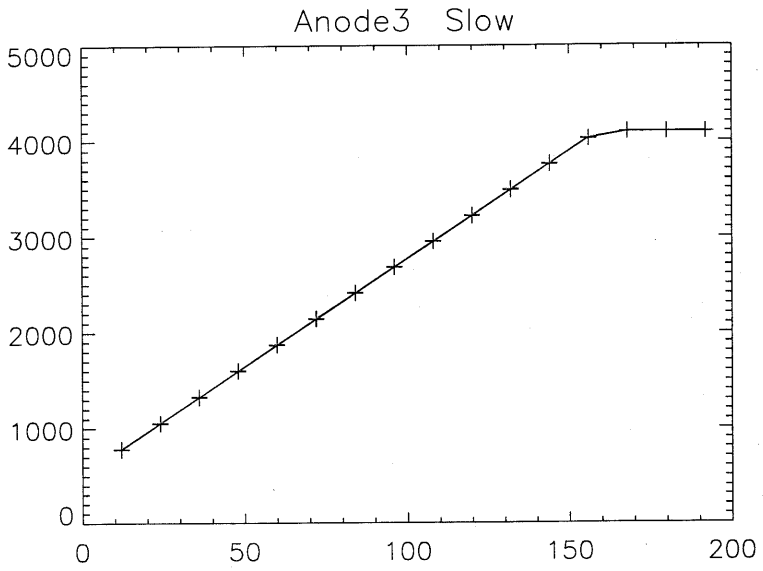
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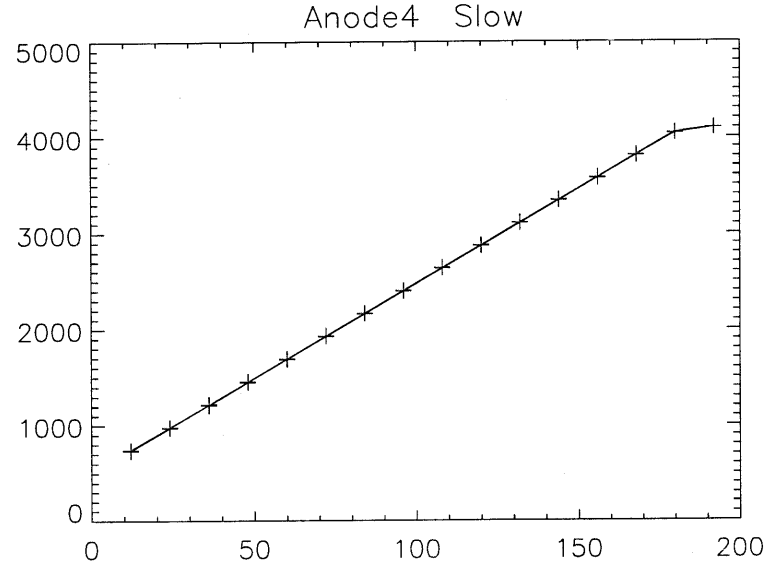
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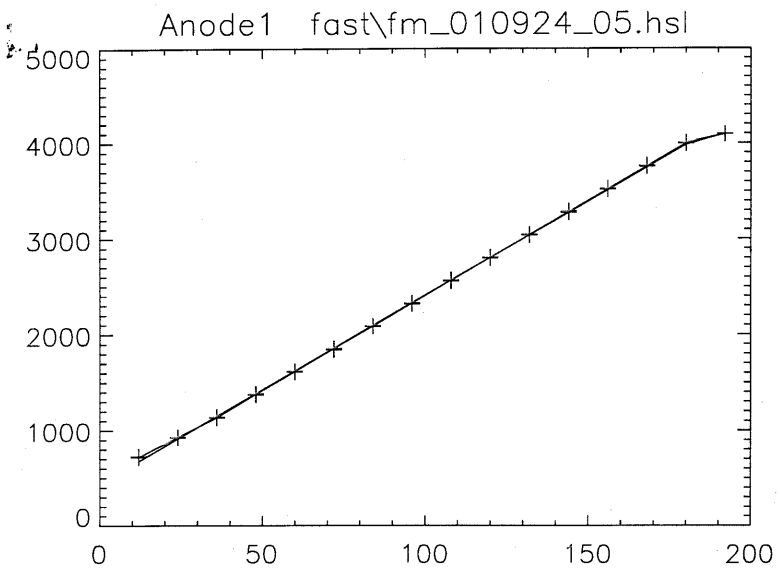
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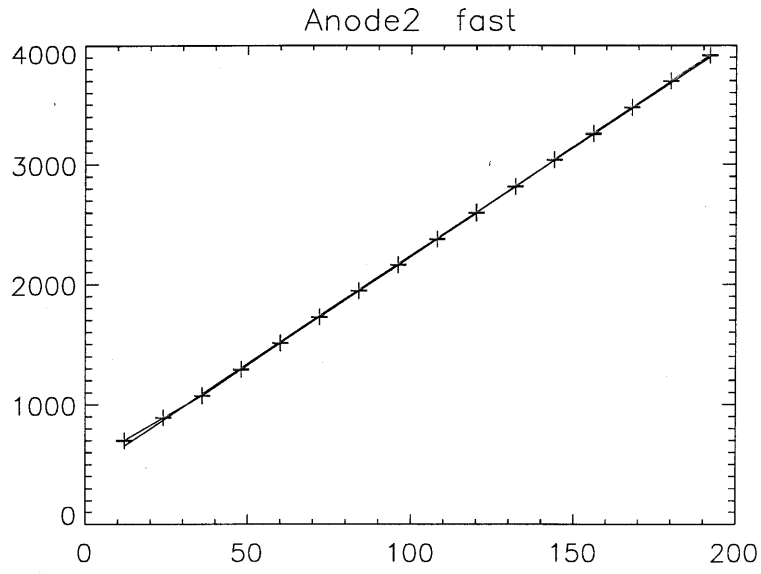
50
100
150
200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3000
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0
0
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150
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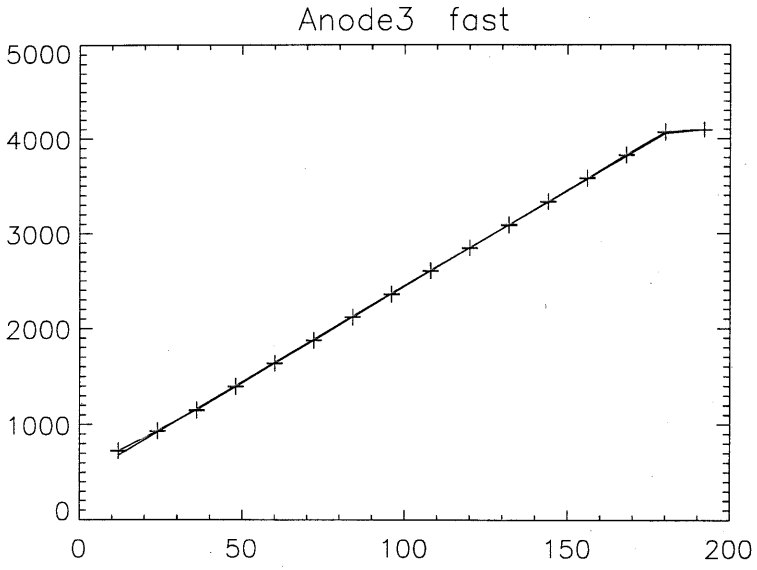
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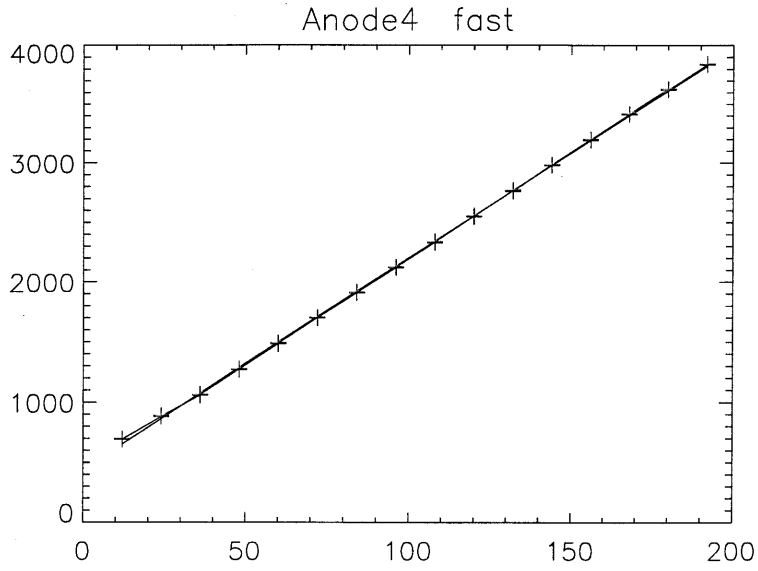
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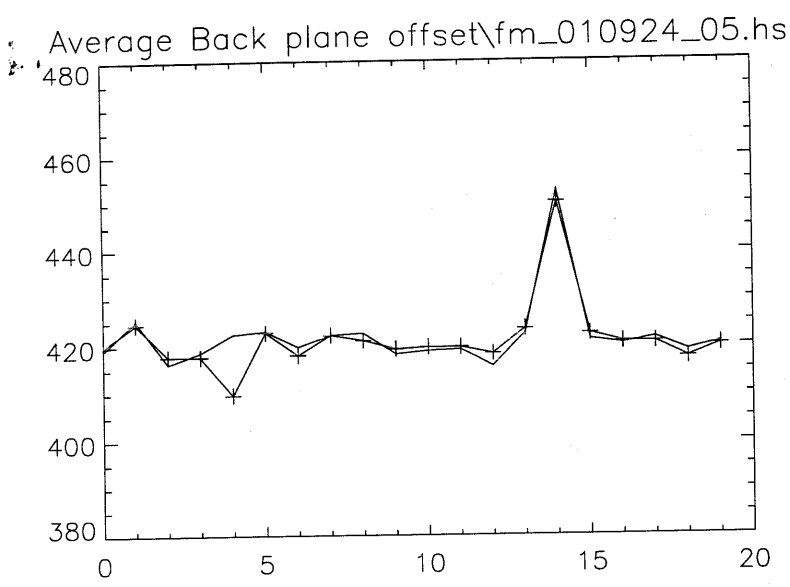
100
150
200

4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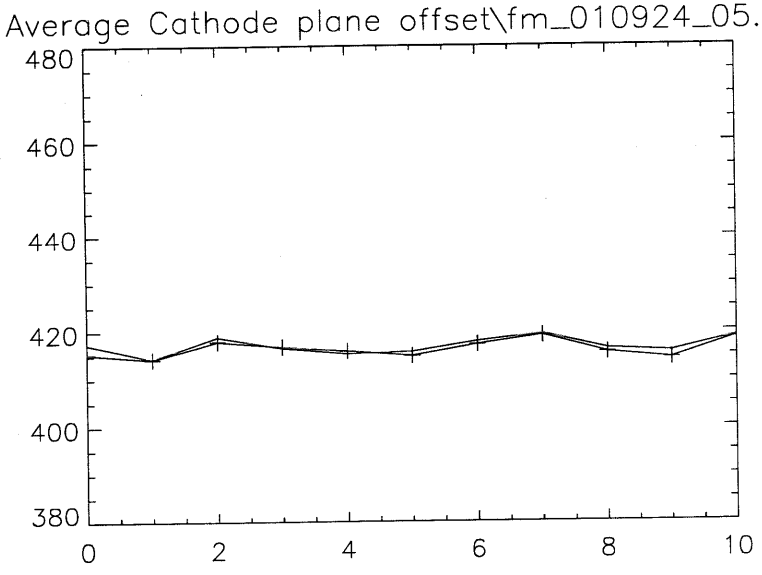
460
440
420
400
380
0
5
10
15
20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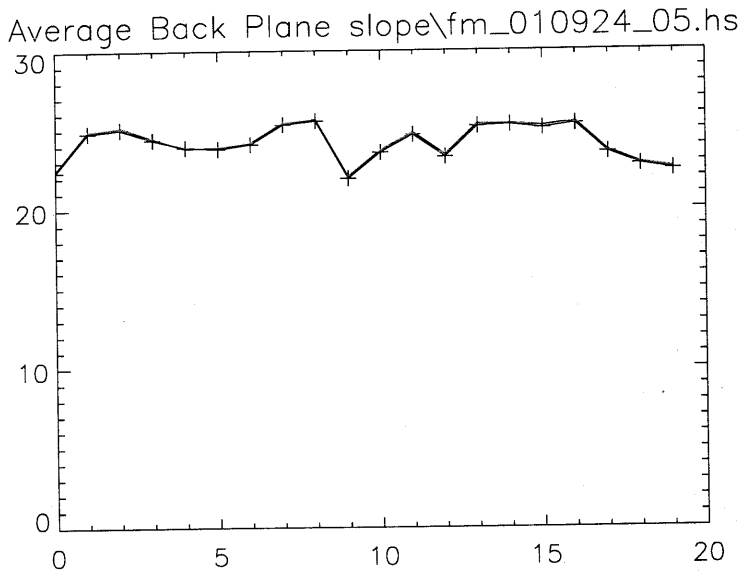
460
440
420
400
380
0
2
4
6
8
10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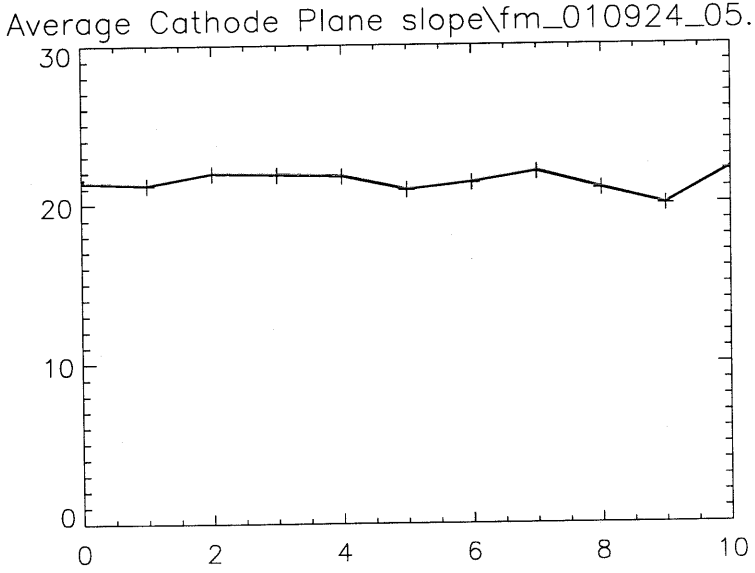
20
10
0
0
5
10
15
20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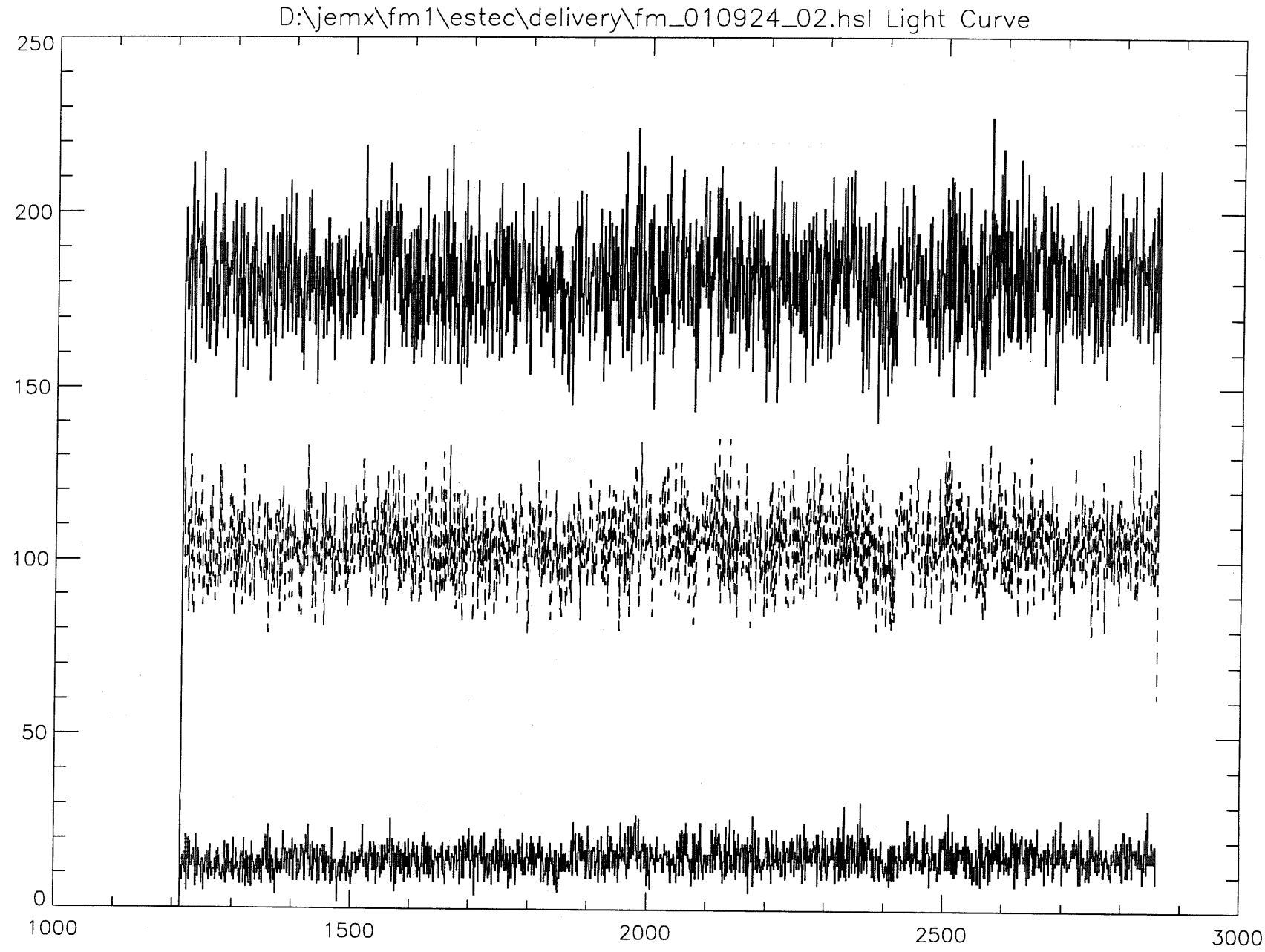
20
10
0
0
2
4
6
8
10

51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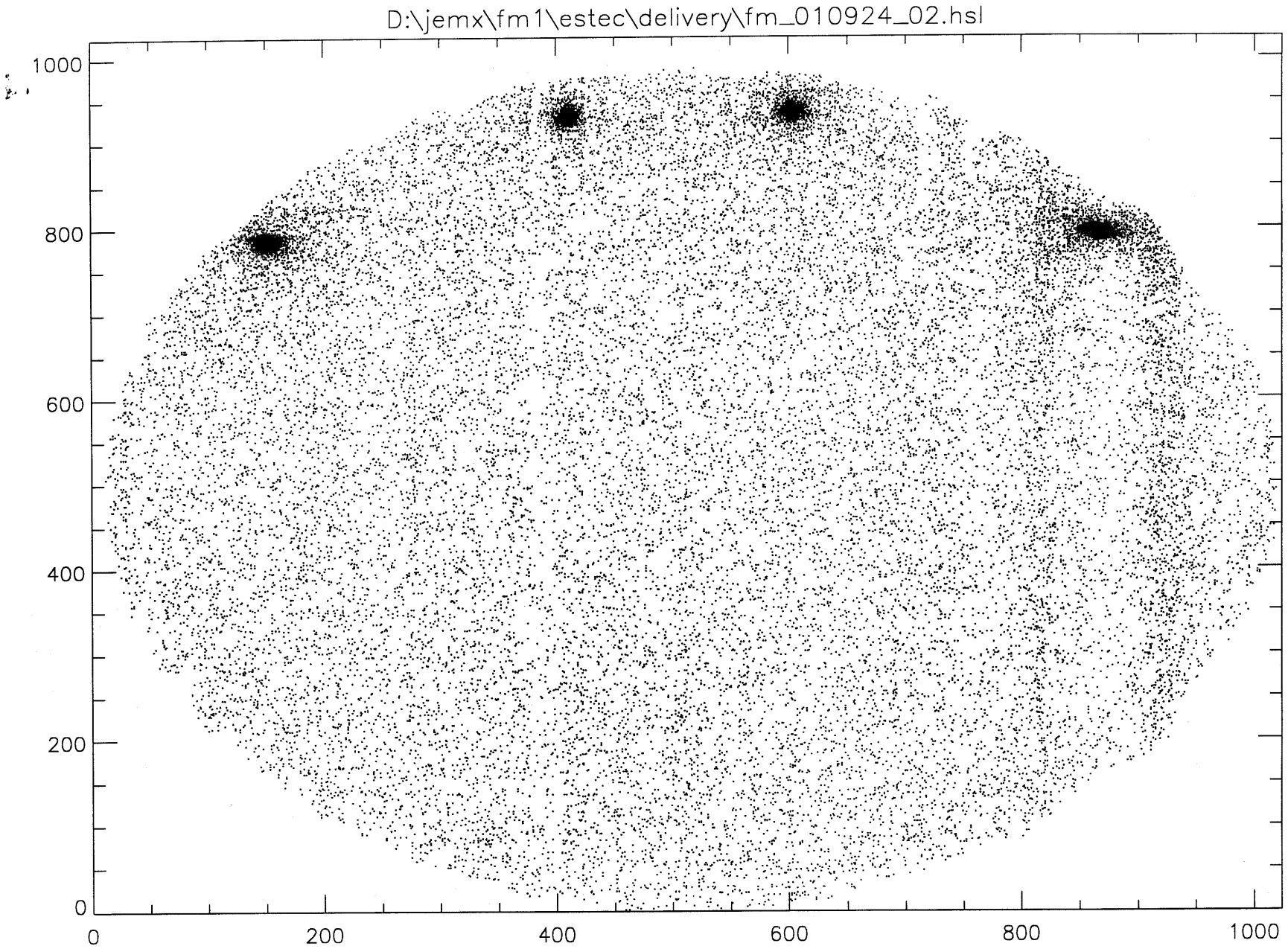
200
150
100
50
0
1000
1500
2000
2500
3000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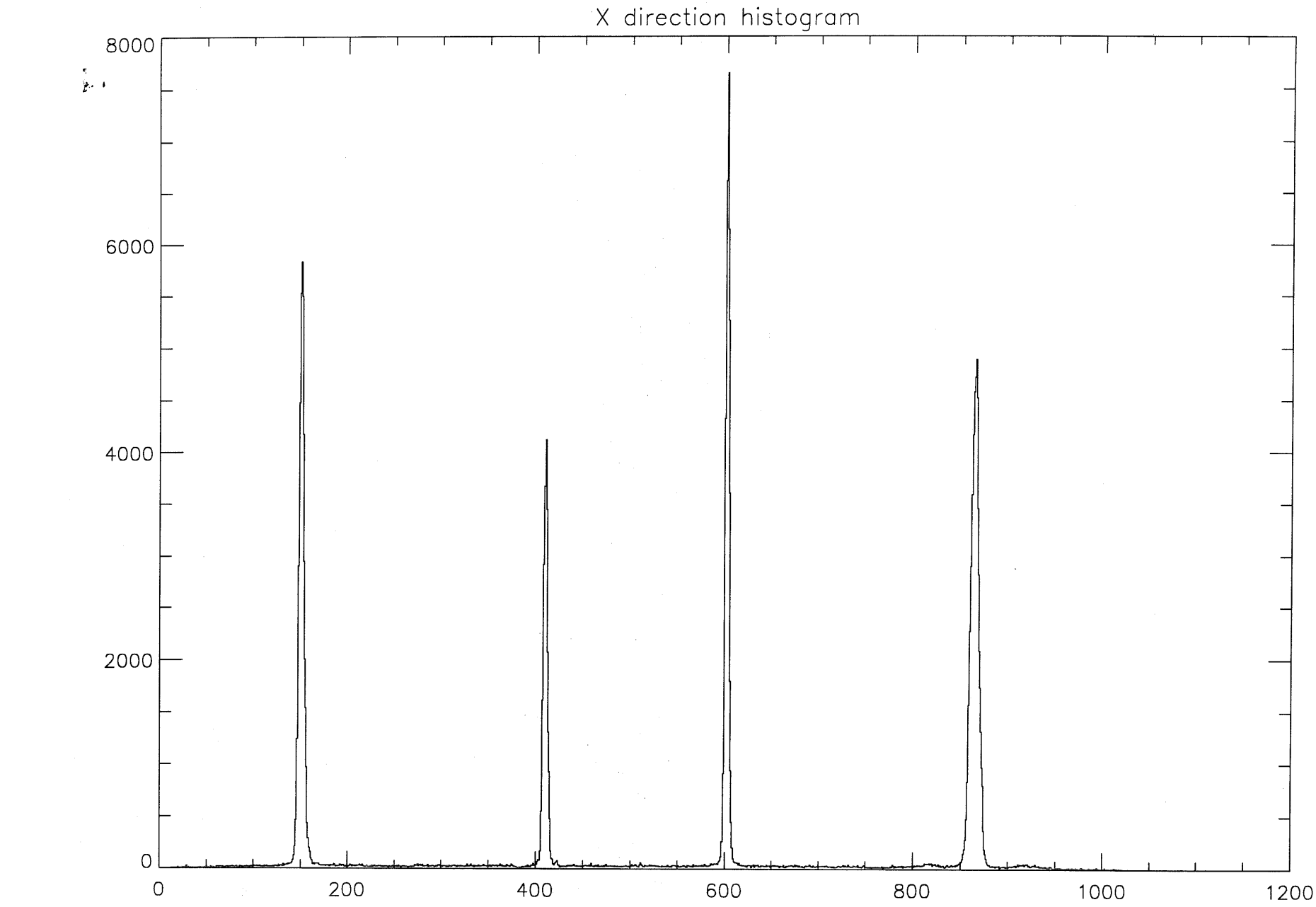
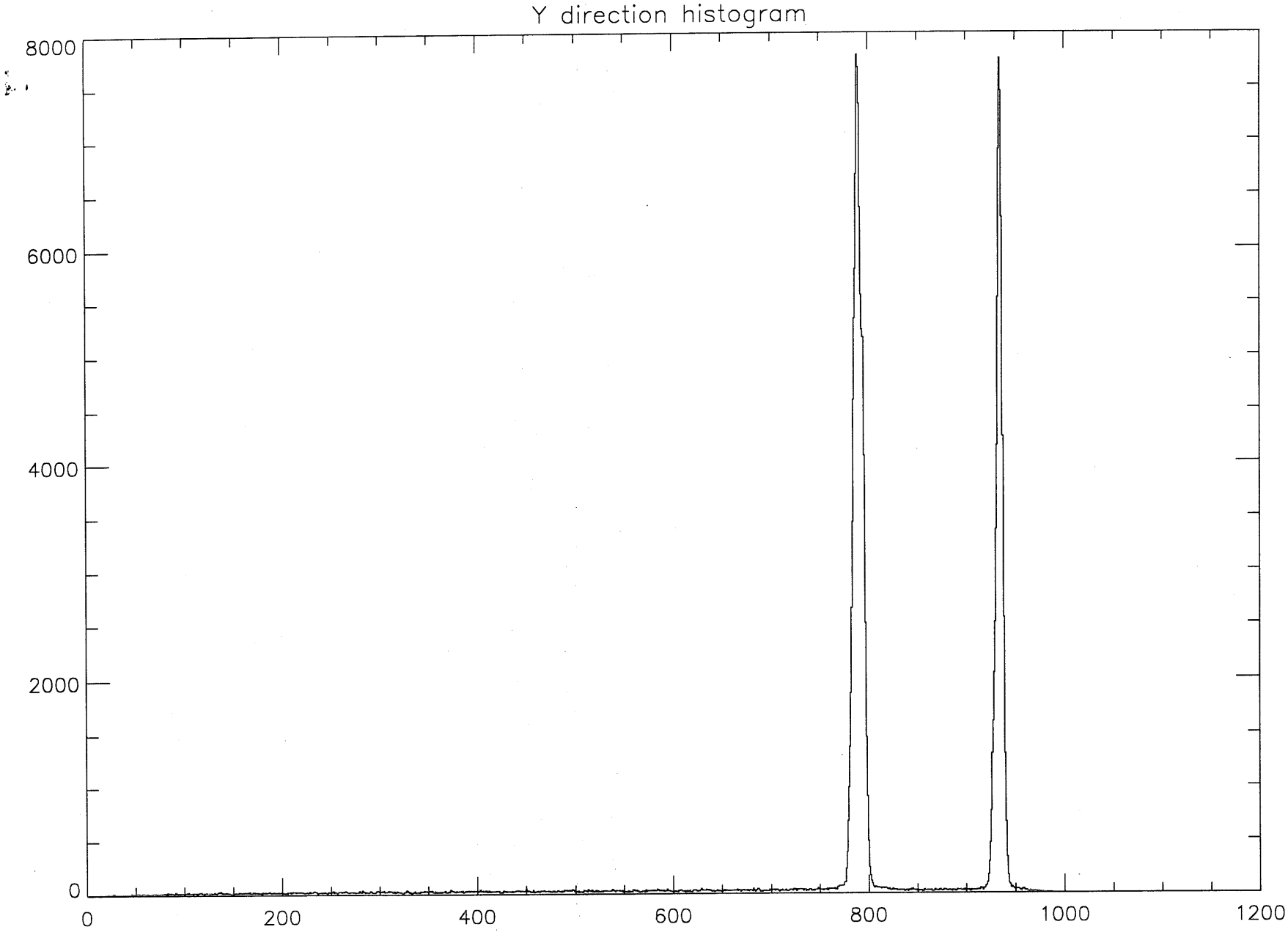
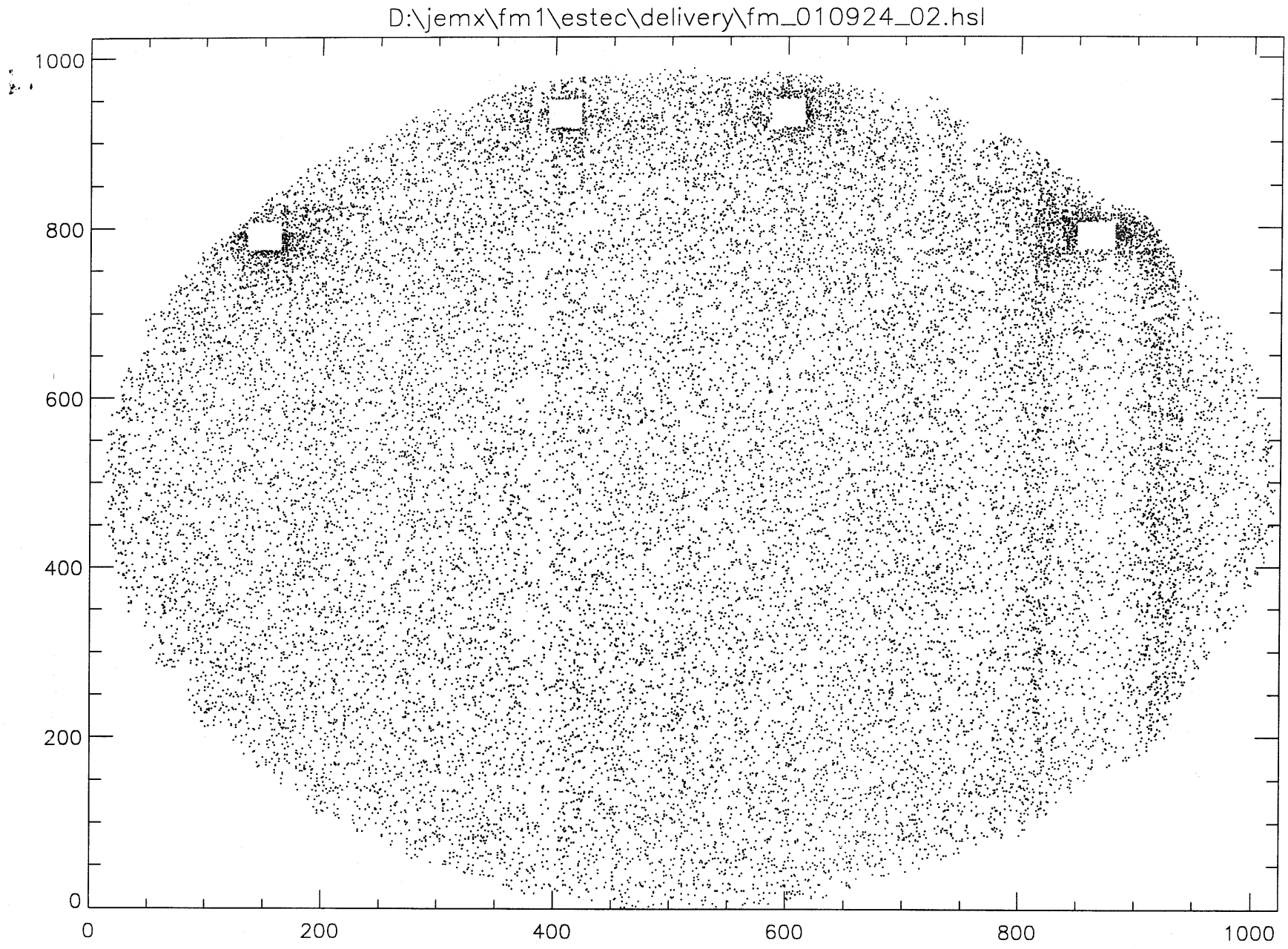
800
600
400
200
0
0
200
400
600
800
1000

2


X direction histogram
8000
6000
4000
2000
0
0
200
400
600
800
1000
1200


Y direction histogram
8000
6000
4000
2000
0
0
200
400
600
800
1000
1200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400
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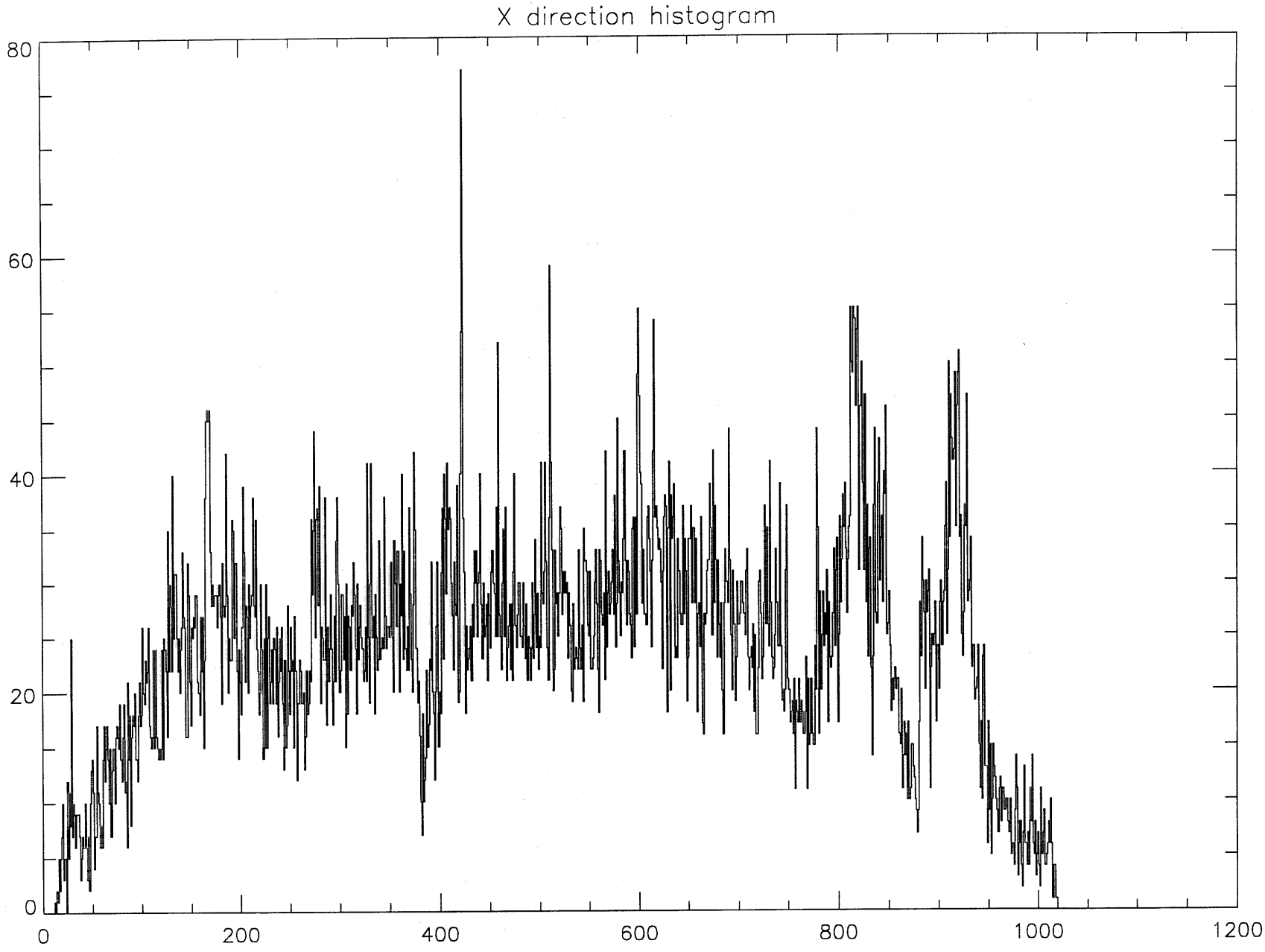
200
400
600
800
1000



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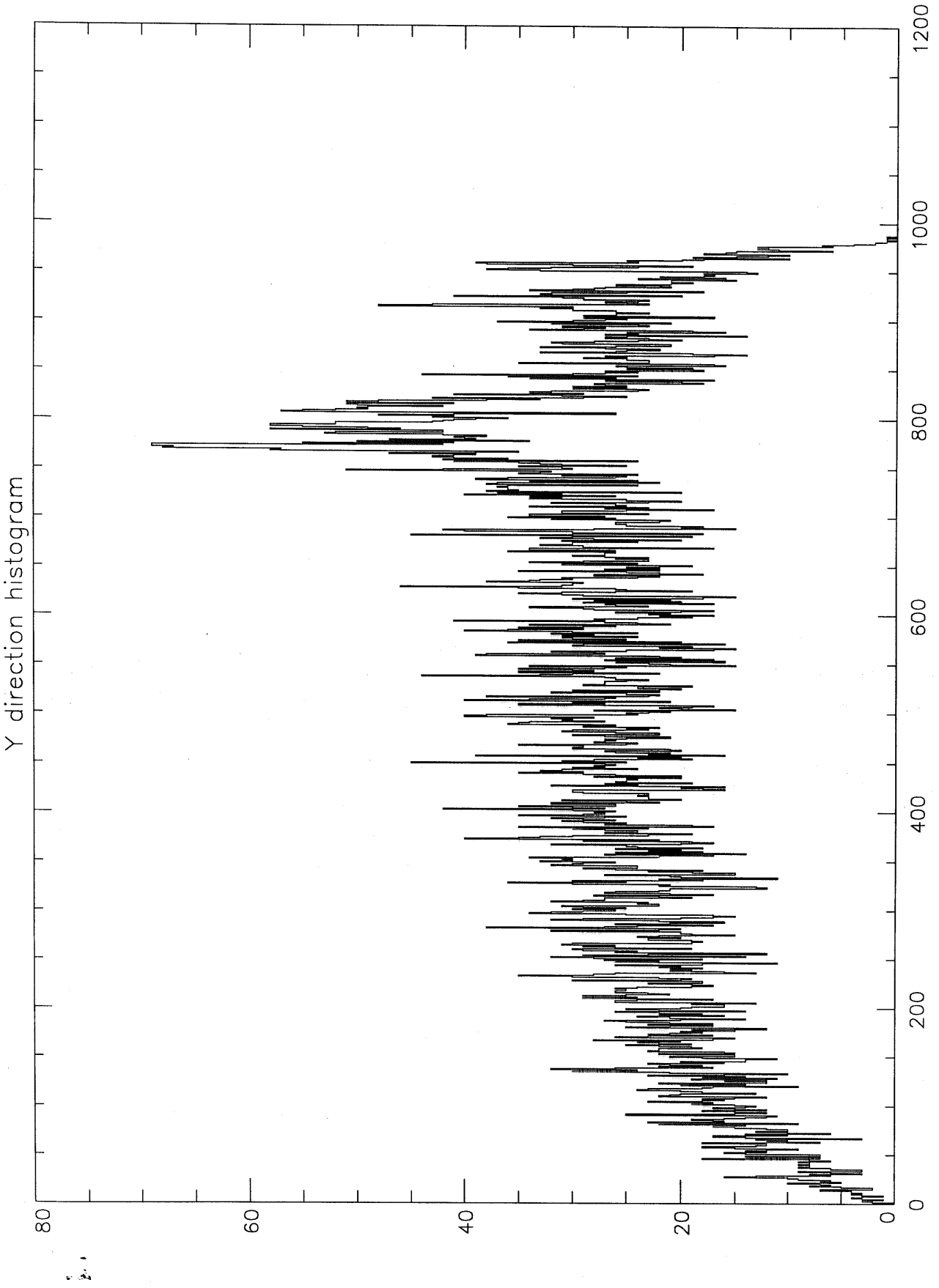
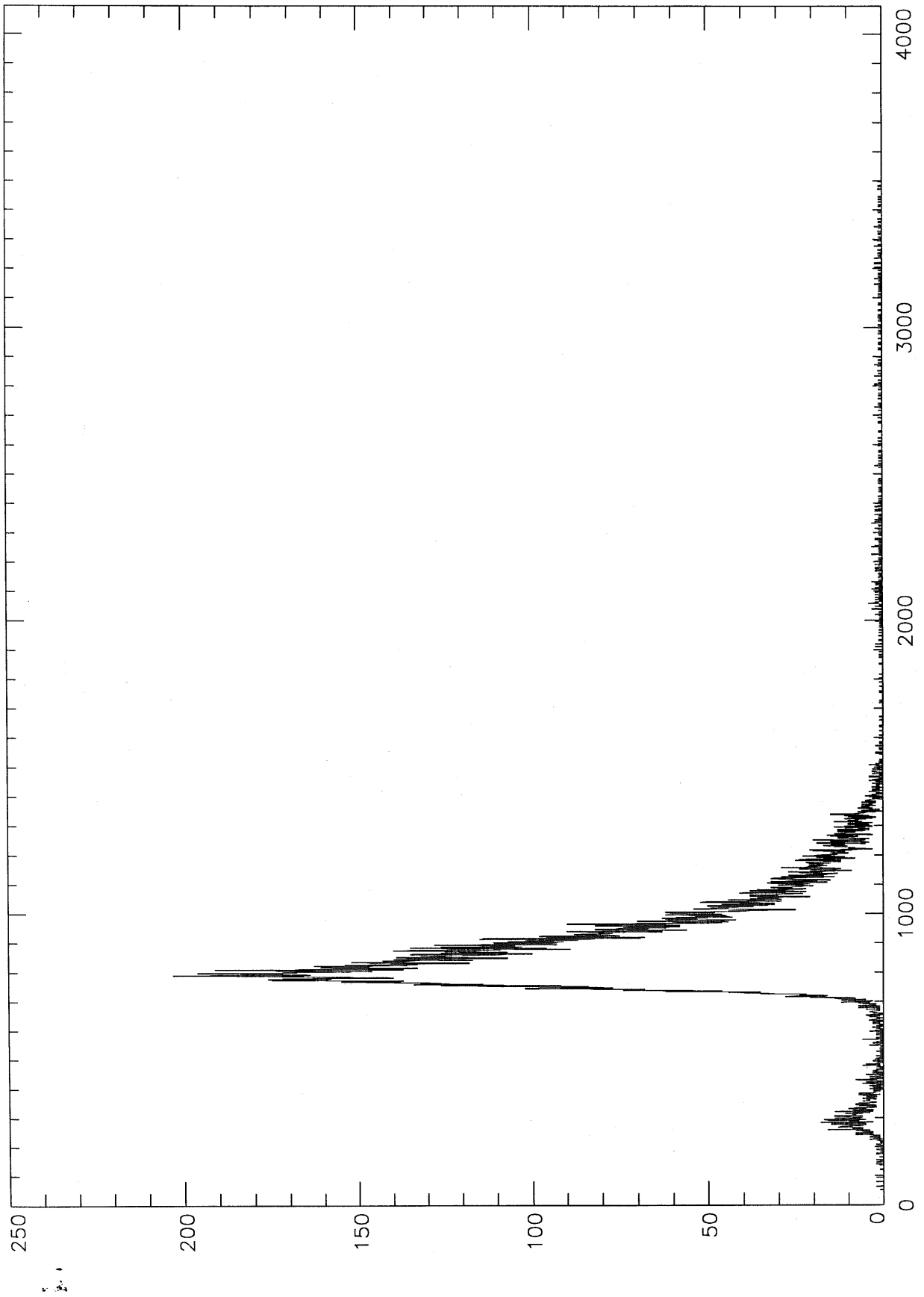
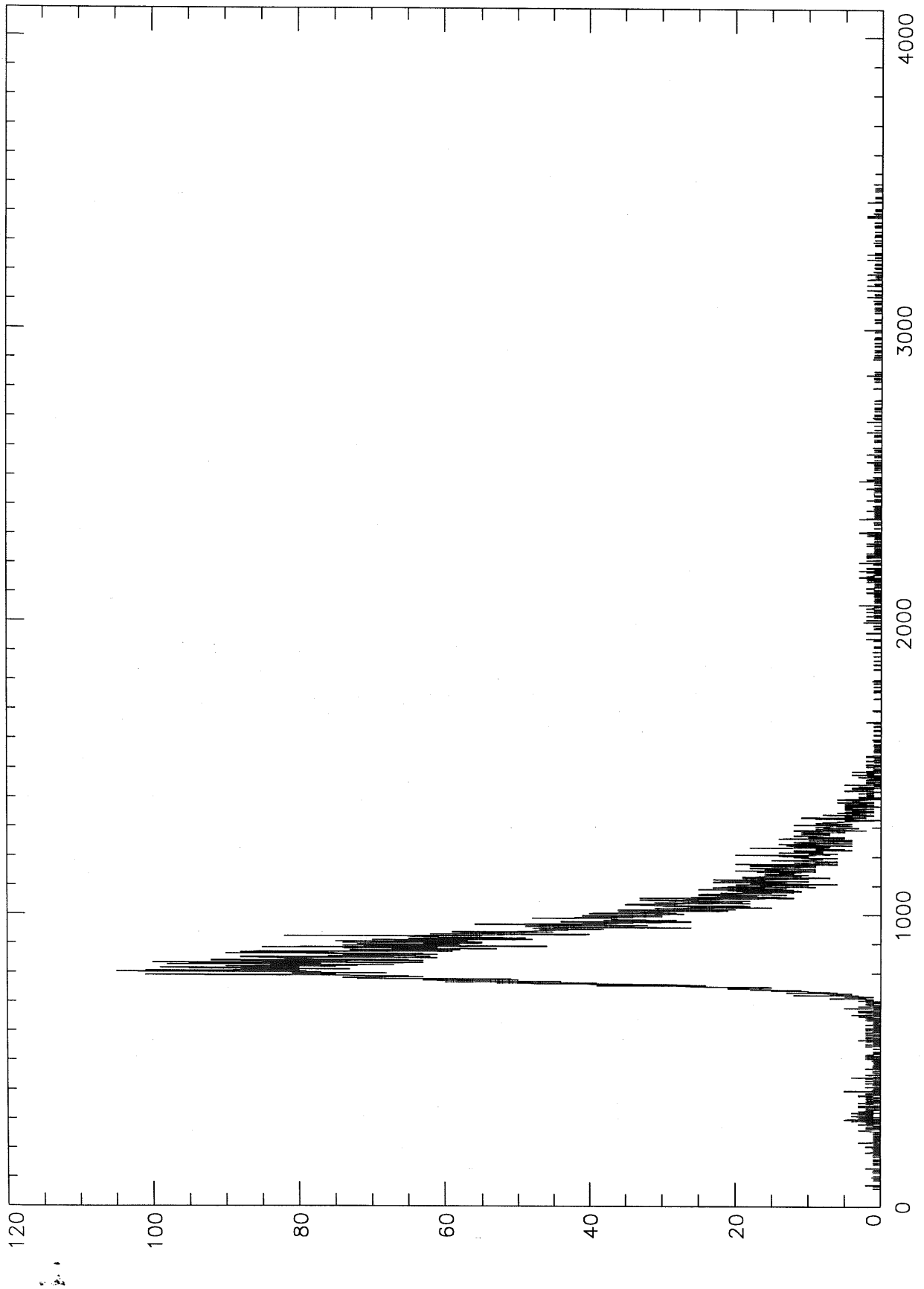
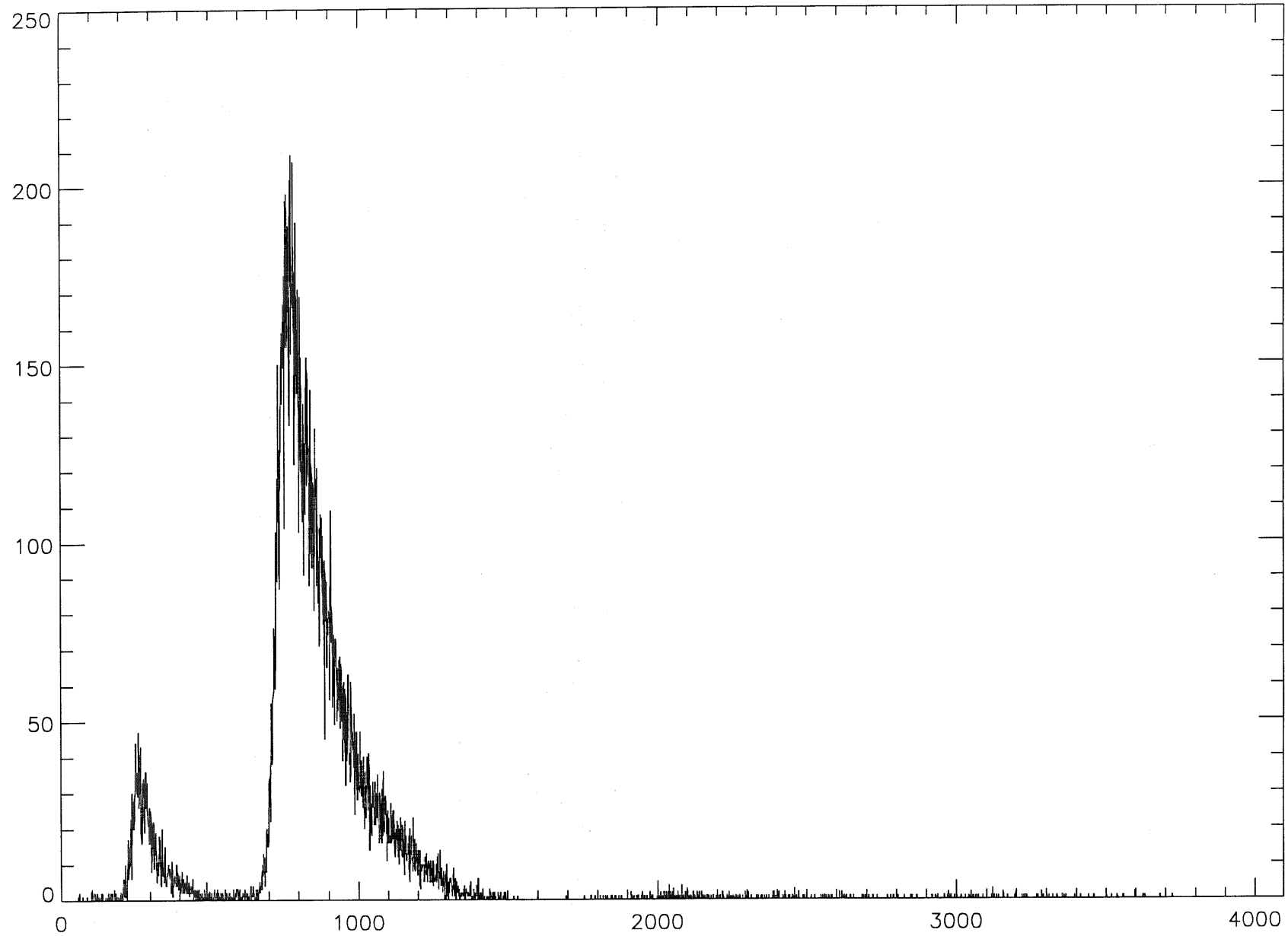

Y direction histogram
0
20
40
60
80
0
200
400
600
800
1000
1200


250
200
150
100
50
0
0
1000
2000
3000
4000


120
100
80
60
40
20
0
0
1000
2000
3000
4000



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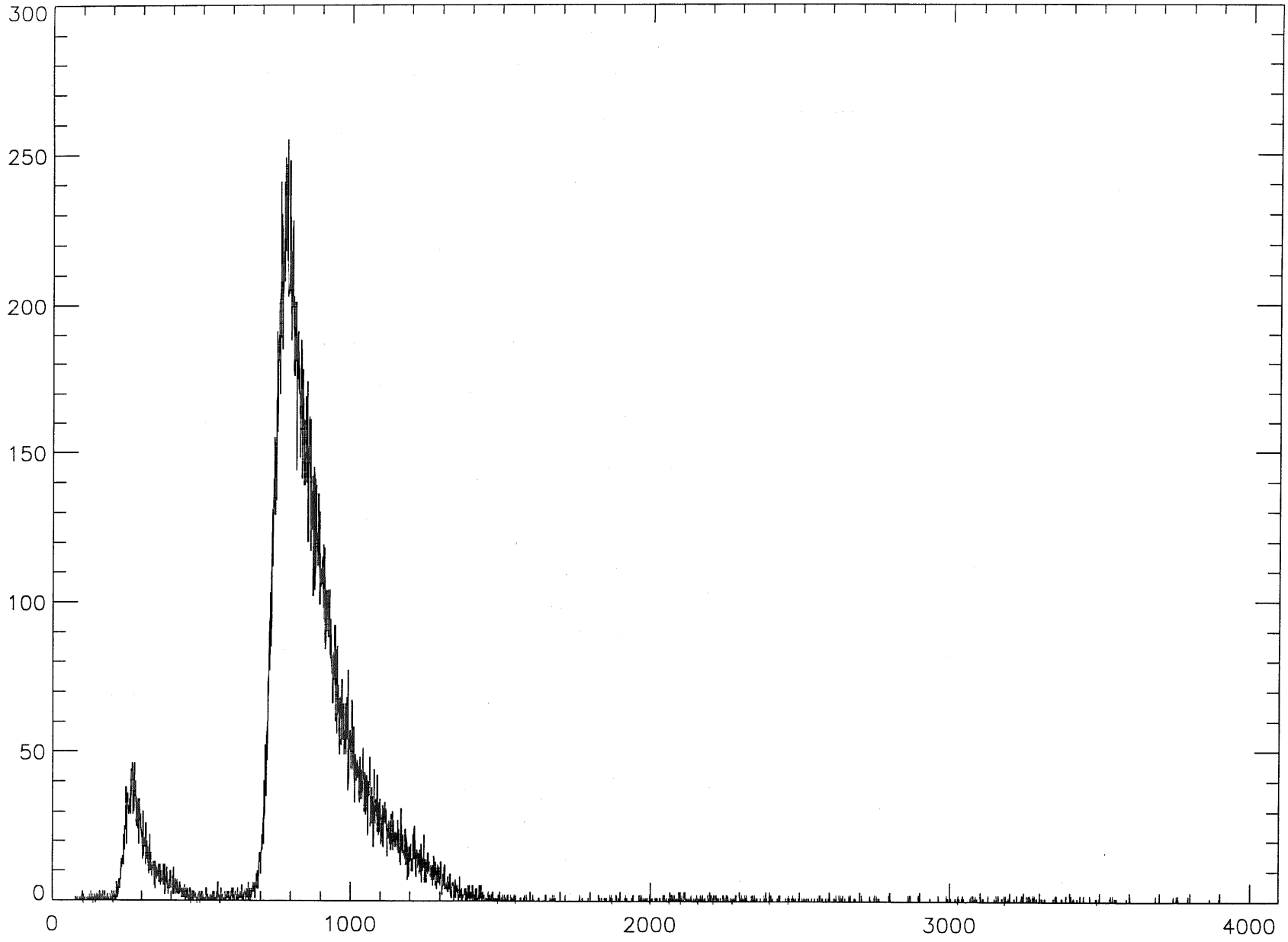
300
250
200
150
100
50
0
0
1000
2000
3000
4000

ANNEX 1:

EXPERIMENT INTERFACE REQUIREMENTS – VERIFICATION BY TEST					
TYPE	**REF**	**REQUIREMENT**	**EM**	**FM**	**COMMENT**
MECHANICAL	MICD	Dimensional control according to latest MICD:			The accuracy of the measurement shall in general be max. 10 % of the quoted tolerance on the MICD.
		Envelope	X	X	
		Mounting hole positions (X&Y positions of all I/F holes)	X	X	
		I/F hole diameters	X	X	
		Spot faced areas		X	
		Mounting feet dimensions		X	MICD JEM-X-130100 rev D
		Mounting feet thickness		X	
		Isolation bushes (if applicable)		X	
		Surface flatness over mounting plane	X	X	
		Connector and ground stud location	X	X	
		Harness length and diameter	X	~~X~~ N/A	
	EID-A 4.2.11	Physical properties:			MICD
		Mass	X	X	
		Centre of Gravity (CoG)		X	
		Moment of Inertia (MoI)		X	
	EID-A 4.2.12	Alignment:			A template to be used for the FM programme will be distributed. MICD
		Alignment mirror location (X,Y,Z)		X	
		Alignment measurement between the instrument optical axes and alignment cube.		~~X~~ N/A	
		Alignment measurement between the instrument mechanical centre and crosshair on alignment cubes.		~~X~~ N/A	Applies to JEM-X and IBIS detectors and masks
	EID-A 4.2.6 4.2.10	Connector and ground stud:			D*M and D*MA connectors as per SCC-spec 3401/022 table 1b. MDM connectors as per SCC-spec 3401/032 table 1.
		Ground stud fixation torque	X	X	
		Connector fixation torque	X	X	

EXPERIMENT INTERFACE REQUIREMENTS – VERIFICATION BY TEST					
TYPE	**REF**	**REQUIREMENT**	**EM**	**FM**	**COMMENT**
THERMAL	TICD	Thermo-optical properties for all surfaces		X	MICD JEM-X-130100 rev D
	TICD	Dimensional control of thermal control surfaces		X	MICD
	TICD	Fit check of thermal protection (MLI)		X	N/A (Mask MLI?)
	EID-A	Heater impedance		X	N/A
POWER	EID-A 4.4.2.1	Short circuit/Open circuit	X	X	Part of functional test IN-TP-JEM-
	EID-A 4.4.2.2	Inrush Current (all power I/F) Rate of change of inrush (<1A/µsec) Inrush peak	X	X	Inrush current shall be defined for all steps from OFF to full operational unit STEP p22
	EID-A 4.4.2.3	Initial electrical status	X	X	Part of functional test IN-TP-JEM-0011 p 29
	EID-A 4.4.3.1	Insulation of power lines Primary power vs. bonding stud (1) Primary power vs. secondary power (2) Secondary power vs. bonding stud	X	X	IN-TP-JEM-0012 (1) p11-12 & EMC Test Report (2) p11-p?
	EID-A 4.4.4	Power allocation. For all operational modes the following shall be defined per power I/F: Average power } "operation" Long peak power } "operation" Short peak power } "Stand by"	X	X	Verification shall be performed at ambient and during TV test. EID-B p 65
DATA HANDLING	EID-A 4.5.2.3	Electrical interfaces to RTU and DPE: Bi-level digital TM Relay status TM Analogue TM Thermistor TH ((YSI 44908) Resistance thermometer (PT-500) On/off commands Low speed link High speed link	X	X	IN-TP-JEM-0012

EXPERIMENT INTERFACE REQUIREMENTS – VERIFICATION BY TEST					
TYPE	**REF**	**REQUIREMENT**	**EM**	**FM**	**COMMENT**
EMC	4.6.2.2	Electrical bonding and case shielding: Adjacent structural parts Connector shells and structure MLI and structure	X N/A	X	EMC test report
FUNCTIONAL	EID-A 5.4.2	Full performance and Limited performance test for nominal and redundant configurations including: Switch on/off (intentionally and unintentionally) Time synchronisation of all units and time stability All operational modes All maintenance and diagnostic modes including memory dump and patch. Onboard autonomy Response to all broad cast package entries. HV switch off Others Command protocol and report (on-event). On-event reporting Functionality of all relays	X	X	Verification shall be performed at ambient and during TV test. INT-TP-JEM-0011 N/A
	EID-A	Validation of all entries in TC and TLM database	X	X	