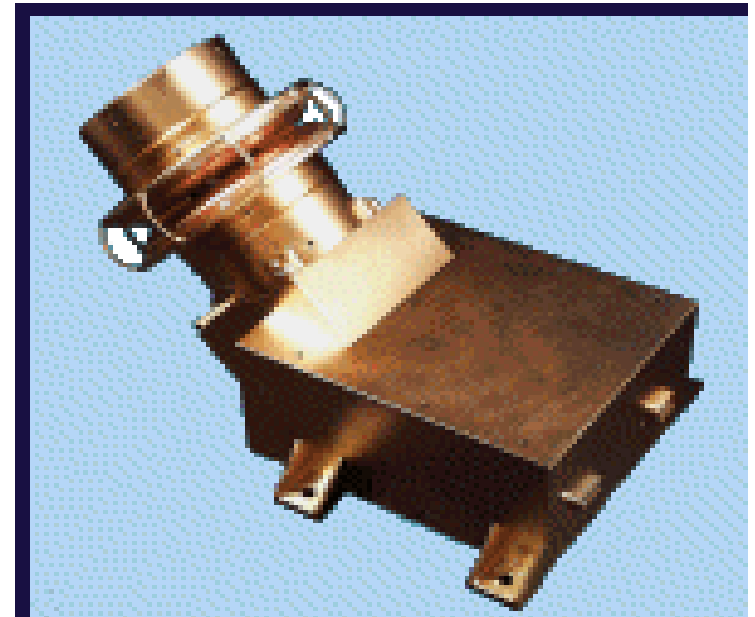


ROSETTA PLASMA CONSORTIUM ION AND ELECTRON SENSOR

Energy: Range	1 eV to 22 KeV
Resolution	0.04
Angle: Range (FOV)	90° x 360° (2.8 Pi sr)
Resolution (elect.)	5° x 22.5° (18 azimuthal x 16 polar)
Resolution (ions)	5° x 45° (5° x 5° for in one sector) (18 azimuthal x 16 polar)
Temporal resolution:	
3D Distribution	128 s
Geometric factor:	
[in units of cm ² sr eV/(eV counts/ion)]	
Total (ions)	5 x 10 ⁻⁴
per 45 deg sector	5 x 10 ⁻⁵
Total (electrons)	5 x 10 ⁻⁵
per sector (electrons)	5 x 10 ⁻⁶



Mass	1040 g
Volume	1297 cm ³
Sensor Dimensions:	
	73 mm dia x 101 mm
Electronics Dimensions:	
	139 mm x 121 mm x 64 mm
Power	1850 mW
Downlink Data Rate	5-250 bps

RPC IES

Data Set Evaluation Tools

Evaluation -

Machine: IBM lenovo T60p ThinkPad
Operating System: openSUSE 10.2

Staging -

Machine: Dell Precision T3400
Operating System: Red Hat Enterprise Linux

Data Processing -

Machine: Sun Ultra-350
Operating System: Sun Solaris OS 5.9

RPC IES Data Sets

ro-a-rpcies-2-ast1-v1.0

ro-a-rpcies-2-ast2-v1.0

ro-a-rpcies-2-ast1-v1.0/DOCUMENT
ro-a-rpcies-2-ast2-v1.0/DOCUMENT
IES_EAICD/10991-IES-EAICD-01_R1.PDF

- ▶ Some sections only have one subsection. A document which has only one subsection should be reorganized to either have no subsections or two subsections. Such is the case of sections 1.2 and 4.3.
- ▶ Subsection number duplicated through text:

2.4.5
2.4.7 *Documentation*
The document directory contains documentation that is considered to be either necessary or simply useful for users to understand the archive data set. These documents are not necessarily appropriate for inclusion in the PDS catalog. Documents may be included in multiple forms (ASCII, PDF, MS Word, HTML with image file pointers, etc.). PDS standards require that any documentation deemed required for use of the data be available in some ASCII format. HTML and PostScript are acceptable as ASCII formats in addition to plain text. Images and drawings will also be included as separate PNG files.

ro-a-rpcies-2-ast1-v1.0/DOCUMENT/IES_EAICD
ro-a-rpcies-2-ast2-v1.0/DOCUMENT/IES_EAICD
10991-IES-EAICD-01_R1.PDF – Cont. 1

- ▶ Appendix A tables: FB not defined and there is no discussion of the result of including this in the averaging. One would think that FB is something beyond the energy scale from the note “Full Range + FB”. If FB lies within the energy range, there is no indication of what energy step or steps this includes.

ro-a-rpcies-2-ast1-v1.0/DOCUMENT/IES_EAICD
ro-a-rpcies-2-ast2-v1.0/DOCUMENT/IES_EAICD
10991-IES-EAICD-01_R1.PDF – Cont. 2

- ▶ Special notes marked by an asterisk (“*”) called out in Appendix A tables are not included in the text.
- ▶ The following modes were found in the data TAB files and not described in the Appendix A tables indicating the method of collapsing data: “03C1” and “3832”. For those mode listed in Appendix tables, it is assumed that the leading “0” character is not printed.

ro-a-rpcies-2-ast1-v1.0/DOCUMENT/IES_EAICD
ro-a-rpcies-2-ast2-v1.0/DOCUMENT/IES_EAICD
10991-IES-EAICD-01_R1.PDF – Cont. 3

- ▶ When determining electron averages in Appendix A, it is not clear what values are used for electron azimuth 11 when it is included in the average for sectors other than electron sector 11.

ro-a-rpcies-2-ast1-v1.0/DOCUMENT/IES_EAICD
ro-a-rpcies-2-ast2-v1.0/DOCUMENT/IES_EAICD
10991-IES-EAICD-01_R1.PDF
10991-IES-EAICD-01_R1.TXT

- ▶ Section 3.4.3.1, directories BROWSE and EXTRAS called out, but not included in structure. The directory called “CALIB” is included in the structure, but not listed in text.
- ▶ Section 3.4.3.2, “RPCIES_REF.CAT” is listed in text, but this file is actually called “REF.CAT” in structure.
- ▶ Section 3.4.3.5, why is the Geometry directory included here, but not to be found in either Section 3.4.3.1 or the data set?

ro-a-rpcies-2-ast1-v1.0/DOCUMENT/IES_EAICD
ro-a-rpcies-2-ast2-v1.0/DOCUMENT/IES_EAICD
10991-IES-EAICD-01_R1.PDF
10991-IES-EAICD-01_R1.TXT – Cont. 1

- ▶ Section 3.4.3.6, the “ANODES” and “GROUND_CALIB” directories, and their file contents are not listed in the text, but are included in these data sets.
- ▶ Section 3.4.3.8, the “EXTRAS” directory as described is close to the “CALIB” directory in contents. Is the file “EXTRINFO.TXT” really called “CALINFO.TXT”?

ro-a-rpcies-2-ast1-v1.0/DOCUMENT/IES_EAICD
ro-a-rpcies-2-ast2-v1.0/DOCUMENT/IES_EAICD
10991-IES-EAICD-01_R1.TXT

- Special characters do not reproduce.
Examples are:

SwRI◆ Project 10991

90◆ x 360◆. The instrument objective is to obtain ion and electron

additional segmentation to 5◆ x 5◆ in the 45◆ polar-angle sector
most

angle field of view to ◆45◆. With the typical top hat polar-angle

These must be handled so that the ASCII text is readable.

ro-a-rpcies-2-ast1-v1.0/DOCUMENT/IES_EAICD
ro-a-rpcies-2-ast2-v1.0/DOCUMENT/IES_EAICD
10991-IES-EAICD-01_R1.TXT – Cont. 1

- ▶ Appendix A does not exist. No reference to an additional document for Appendix A

ro-a-rpcies-2-ast1-v1.0/CATALOG
ro-a-rpcies-2-ast2-v1.0/CATALOG
RPCIES_SOFTWARE.CAT

- ▶ Why is this file included when no software is included?

ro-a-rpcies-2-ast1-v1.0/CATALOG
ro-a-rpcies-2-ast2-v1.0/CATALOG
RPCIES_PERS.CAT

- ▶ Why is Aimee Mostella listed as being a contact? She is no longer at SwRI and will not be available as a contact when this data is released.

ro-a-rpcies-2-ast1-v1.0/CATALOG
ro-a-rpcies-2-ast2-v1.0/CATALOG
TARGET.CAT

- ▶ Why is the flattening formula given for every planet except “EARTH”?
- ▶ For targets “JUPITER”, “MARS”, “SATURN”, and “VENUS” when describing the flattening formula, the radius described by the C_AXIS_RADIUS should be a “PR”, not an “ER” as stated.

ro-a-rpcies-2-ast1-v1.0/CATALOG
ro-a-rpcies-2-ast2-v1.0/CATALOG
RPCIES_INST.CAT

- ▶ Some corrections sent to PDS.
- ▶ No description discusses the dead time required between power supply stepping and this effect on the accumulation period. This information is necessary to estimate the error in the count rate values in the data tables. It would seem that the science team would need this information as well in order to interpret spectral data less than 128 sec, which might be observed as the spacecraft passes through a plasma jet coming from the comet.

ro-a-rpcies-2-ast1-v1.0/CATALOG
ro-a-rpcies-2-ast2-v1.0/CATALOG
RPCIES_INST.CAT – Cont. 1

- ▶ No description discusses flyback and what it means. No description of its effect on the science data as Appendix A of the ICD shows that it is used in averaging.
- ▶ The geometric factor for the 5 deg ion sectors should be listed.
- ▶ Why is the geometric factor for electrons have units which include counts/ion?

ro-a-rpcies-2-ast1-v1.0/CATALOG
ro-a-rpcies-2-ast2-v1.0/CATALOG
REF.CAT

- ▶ Reference Key ID “ALTWEGGETAL2012” is missing the year in description of reference.
- ▶ Reference Key ID “ANDREWSETAL2011” is missing the author in description of reference.
- ▶ Reference Key ID “BESSEL1999” is missing the title; it should be: "Spectrophotometry: Revised Standards and Techniques". Also, the journal abbreviation should be "Publ. Astron. Soc. Pac." Journal abbreviations should follow ISI Standards:

<http://library.caltech.edu/reference/abbreviations/>

ro-a-rpcies-2-ast1-v1.0/CATALOG
ro-a-rpcies-2-ast2-v1.0/CATALOG
REF.CAT – Cont. 1

- ▶ Reference Key ID “HAMUYETAL1992” has an incorrect title; it should be: “Southern spectrophotometric standards. I”. Also, the journal abbreviation should be “Publ. Astron. Soc. Pac.”
- ▶ Reference Key ID “HAMUYETAL1994” has an incorrect title; it should be: “Southern spectrophotometric standards. II”. Also, the journal abbreviation should be “Publ. Astron. Soc. Pac.”

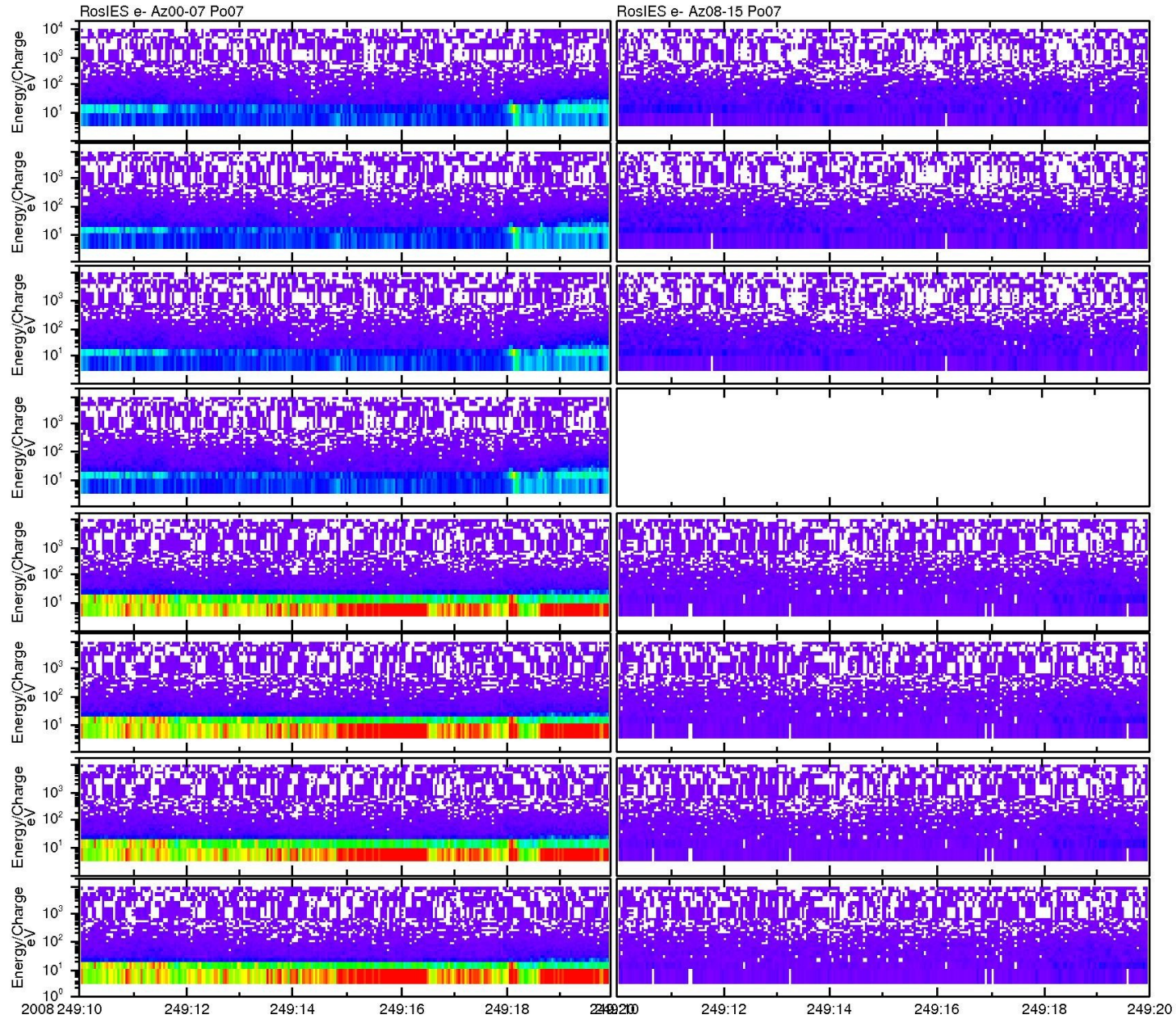
ro-a-rpcies-2-ast1-v1.0/CATALOG
ro-a-rpcies-2-ast2-v1.0/CATALOG
REF.CAT – Cont. 2

- ▶ Reference Key ID “KUPPERS2011” is missing the year in description of reference.
- ▶ Reference Key ID “LANDOLT1992” the journal is abbreviated “Astron. J.”, not “AJ”.
- ▶ Reference Key ID “SOUBUIRAN&TRIAUD2004” the journal is abbreviated “Astron. Astrophys.”, not “A&A”.
- ▶ Some references like “CREMONESEETALK2012”, “THOMASETAL2011”, and “VINCENTETAL2011” for example have an inconsistent order relative to the rest of the reference formats in this file. The reference formats should be consistent!

ro-a-rpcies-2-ast1-v1.0/CATALOG
ro-a-rpcies-2-ast2-v1.0/CATALOG
REF.CAT – Cont. 3

- ▶ Attempted to get the referenced reports from REF.CAT file. Reference Key ID “BAERETAL1999” exists in PDS reference labels and I can even download this label, but I can not find this document anywhere. What good is it to reference a document which can not be obtained?
- ▶ Tested and found document for Reference Key ID “RO-EST-RP-3321”.
- ▶ Tested and did NOT find document for Reference Key ID “DSN871-049-041”

ro-a-rpcies-2-ast1-v1.0/data (Steins) Raw Electrons



Raw Electron Data (Steins)

- ▶ Used instrument cycle period of 128 sec
- ▶ Assumed energy step is $1/16$ sec = 0.0625 sec
- ▶ Assumed 10% data latency (0.00625 sec) giving a data accumulation period of 0.05625 sec (Not Given in any Documentation)
- ▶ Used energy step values from file in CALIB directory.
- ▶ Labelled azimuth and polar angle values from file in CALIB directory.

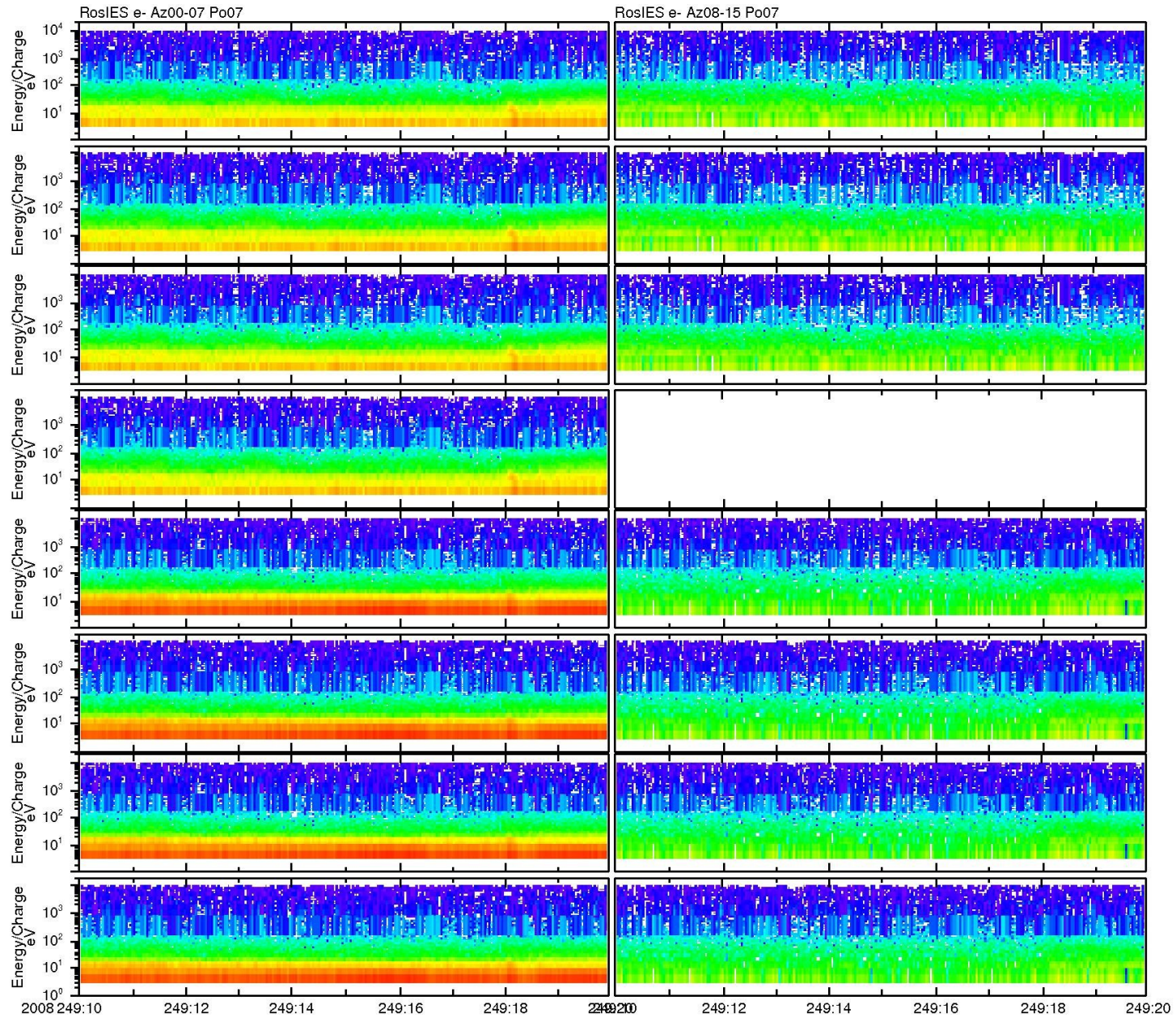
Raw Electron Data (Steins) DATA Files

- ▶ RPCIES080905_ELC_V2.LBL OBJECT = TABLE contains ROWS = 218737; however, the corresponding TAB file contains only 218736 rows.
- ▶ RPCIES080905_ELC_V2.TAB contains the mode “03C1” not described as part of Appendix A in the EAICD.

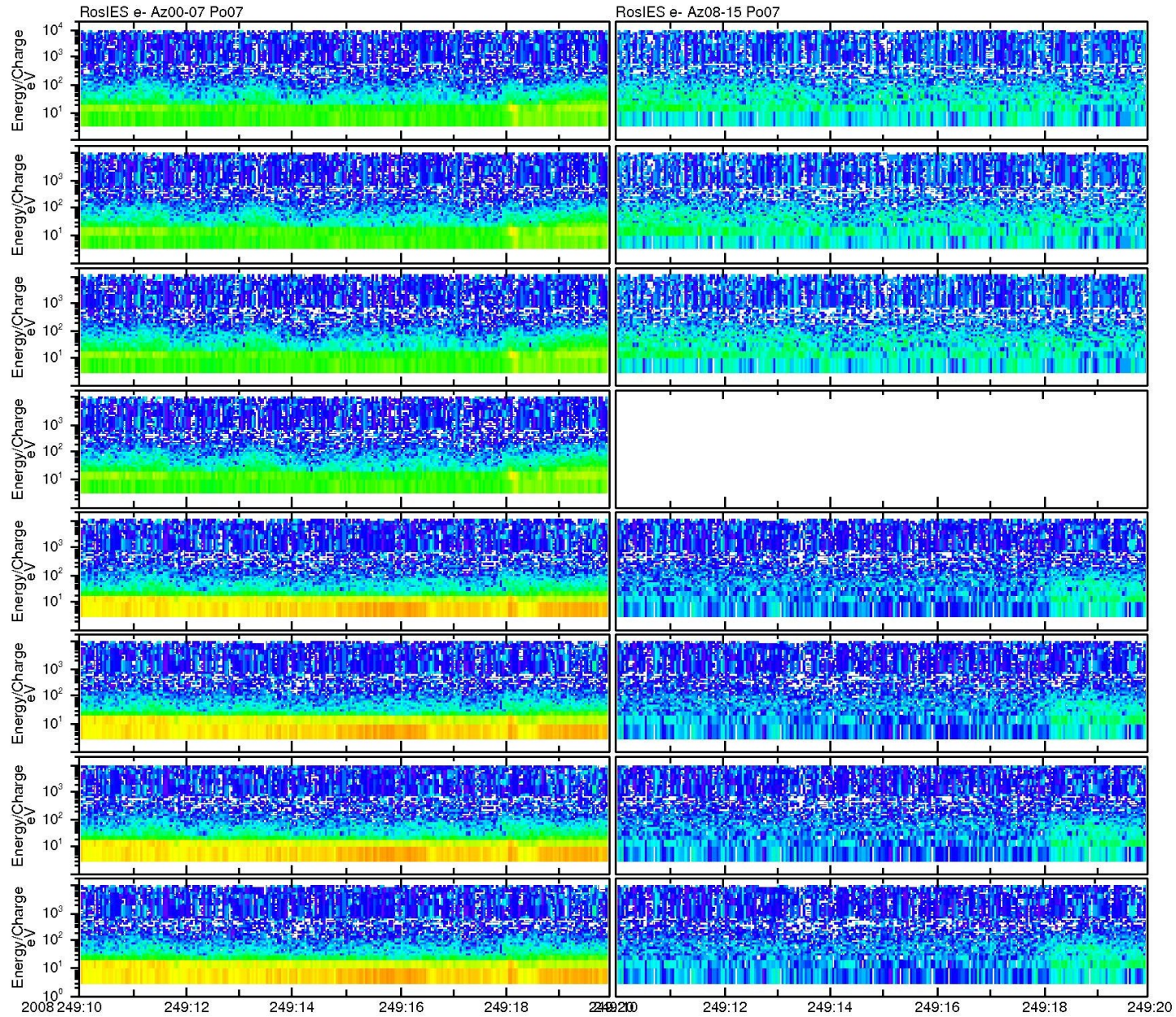
Raw Electron Data (Steins) DATA Files – Cont. 1

- ▶ RPCIES080906_ELC_V2.LBL OBJECT = TABLE contains ROWS = 70561; however, the corresponding TAB file contains only 70560 rows.
- ▶ RPCIES080906_ELC_V2.TAB contains the mode “03C1” not described as part of Appendix A in the EAICD.

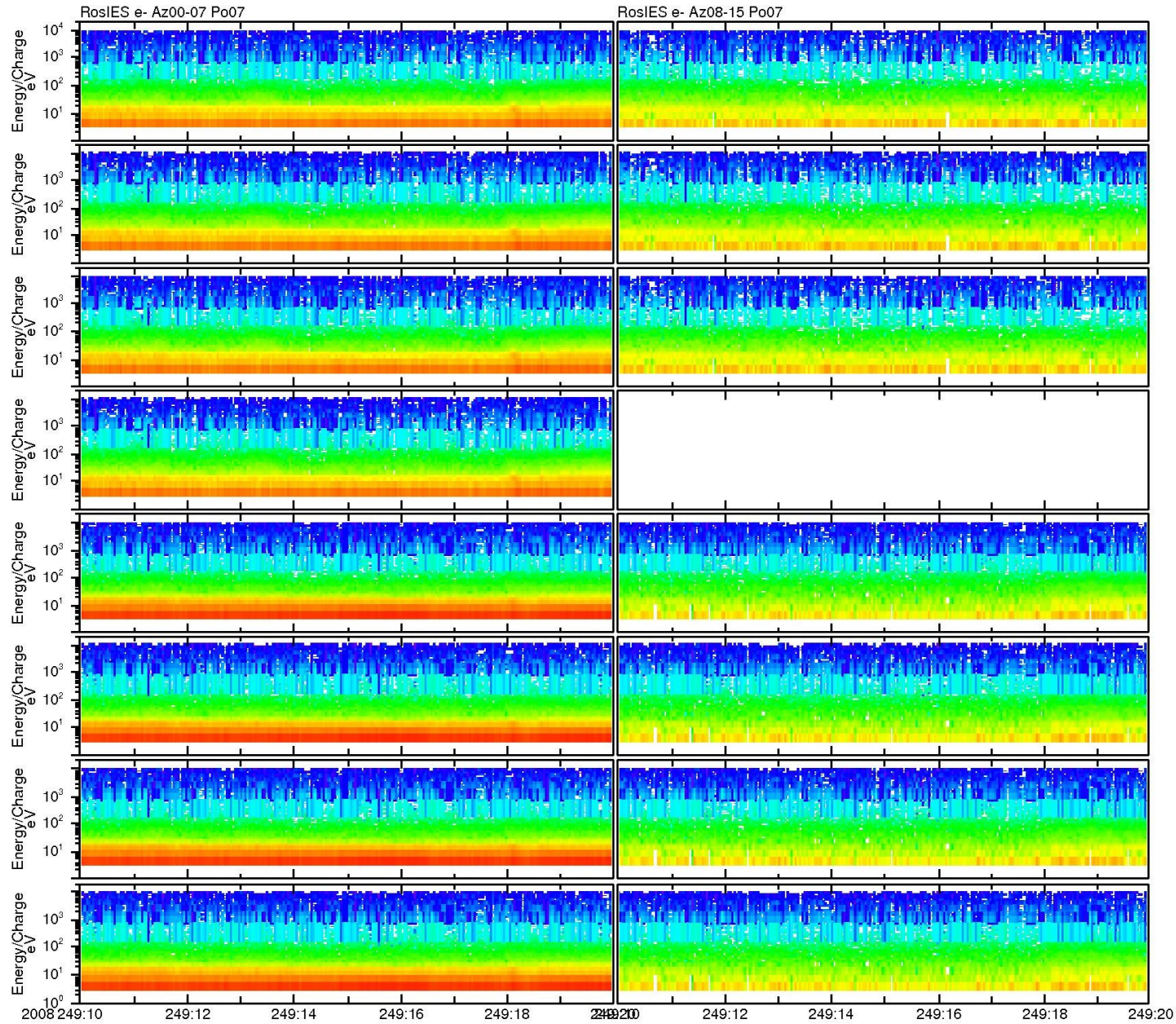
ro-a-rpcies-2-ast1-v1.0/data (Steins) Electron Intensity



ro-a-rpcies-2-ast1-v1.0/data (Steins) Electron Energy Intensity



ro-a-rpcies-2-ast1-v1.0/data (Steins) Electron Distribution Function



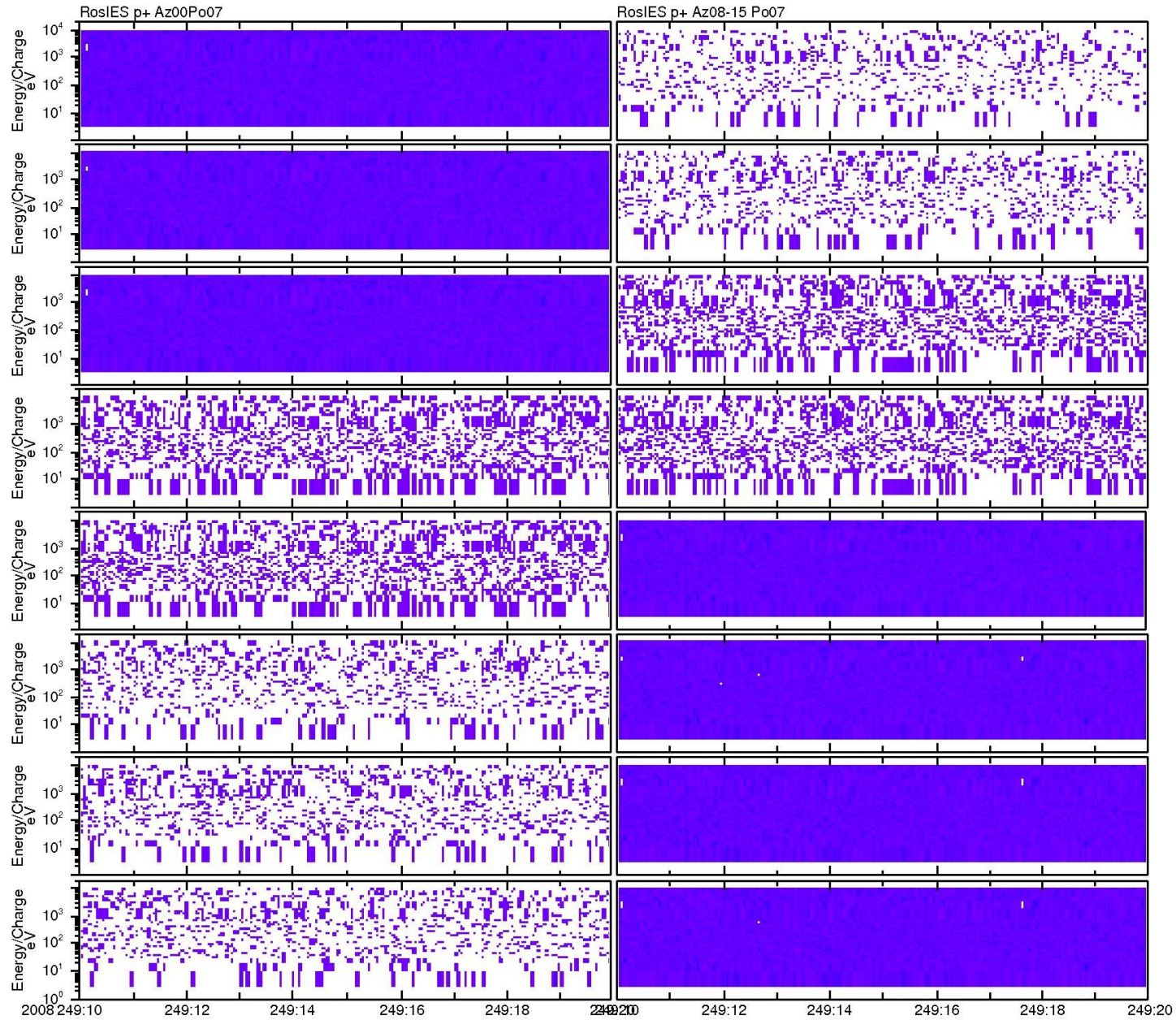
Reconstructed Electron Data (Steins)

- ▶ Used instrument cycle period of 128 sec
- ▶ Assumed energy step is $1/16$ sec = 0.0625 sec
- ▶ Assumed 10% data latency (0.00625 sec)
giving a data accumulation period of 0.05625
sec (Not Given in any Documentation)
- ▶ Used energy step values from file in CALIB
directory.
- ▶ Labelled azimuth and polar angle values from
file in CALIB directory.
- ▶ Used Energy Resolution of 4% $\Delta E/E$

Reconstructed Electron Data (Steins) - Cont. 1

- ▶ Used Electron Geometric Factor of $5 \times 10^{-6} \text{ cm}^2 \text{ sr}$
- ▶ Not Enough Information to Model the MCP Efficiency with a Bordoni Curve (assumed 0.95)
- ▶ Used EAICD Appendix A; however, no mode ID given in the data was listed. Assumed no summations.

ro-a-rpcies-2-ast1-v1.0/data (Steins) Raw Ions



Raw Ion Data (Steins)

- ▶ Used instrument cycle period of 128 sec
- ▶ Assumed energy step is $1/16$ sec = 0.0625 sec
- ▶ Assumed 10% data latency (0.00625 sec) giving a data accumulation period of 0.05625 sec (Not Given in any Documentation)
- ▶ Used energy step values from file in CALIB directory.
- ▶ Labelled azimuth and polar angle values from file in CALIB directory.

Raw Ion Data (Steins) DATA Files

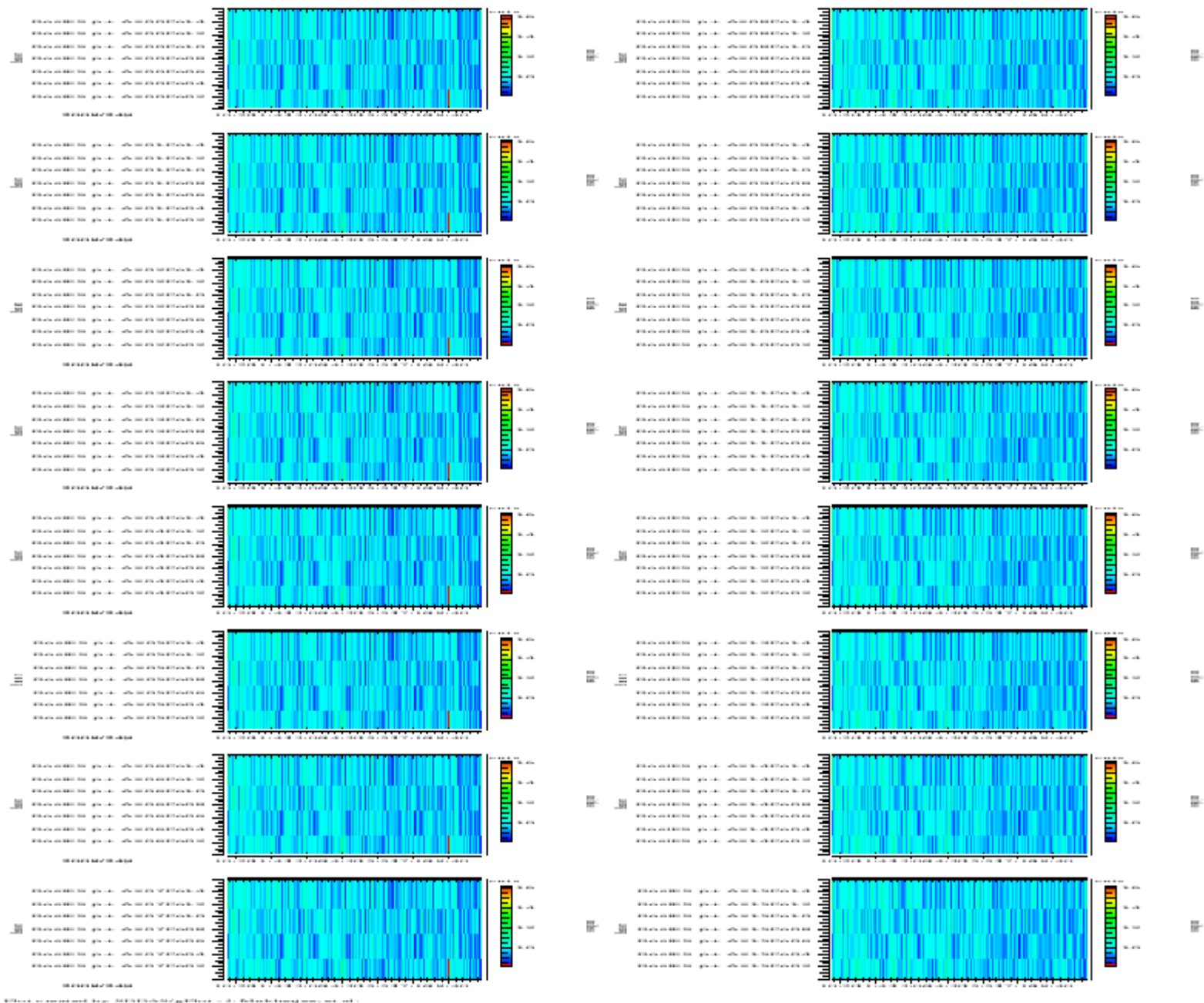
- ▶ RPCIES080905_ION_V2.LBL OBJECT = TABLE contains ROWS = 109369; however, the corresponding TAB file contains only 109368 rows.
- ▶ RPCIES080905_ION_V2.TAB contains the mode “03C1” not described as part of Appendix A in the EAICD.

Raw Ion Data (Steins) DATA Files – Cont. 1

- ▶ RPCIES080906_ION_V2.LBL OBJECT = TABLE contains ROWS = 35029; however, the corresponding TAB file contains only 35028 rows.
- ▶ RPCIES080906_ION_V2.TAB contains the mode “03C1” not described as part of Appendix A in the EAICD.

ro-a-rpcies-2-ast1-v1.0/data (Steins)

Locate Raw Solar Wind Ions

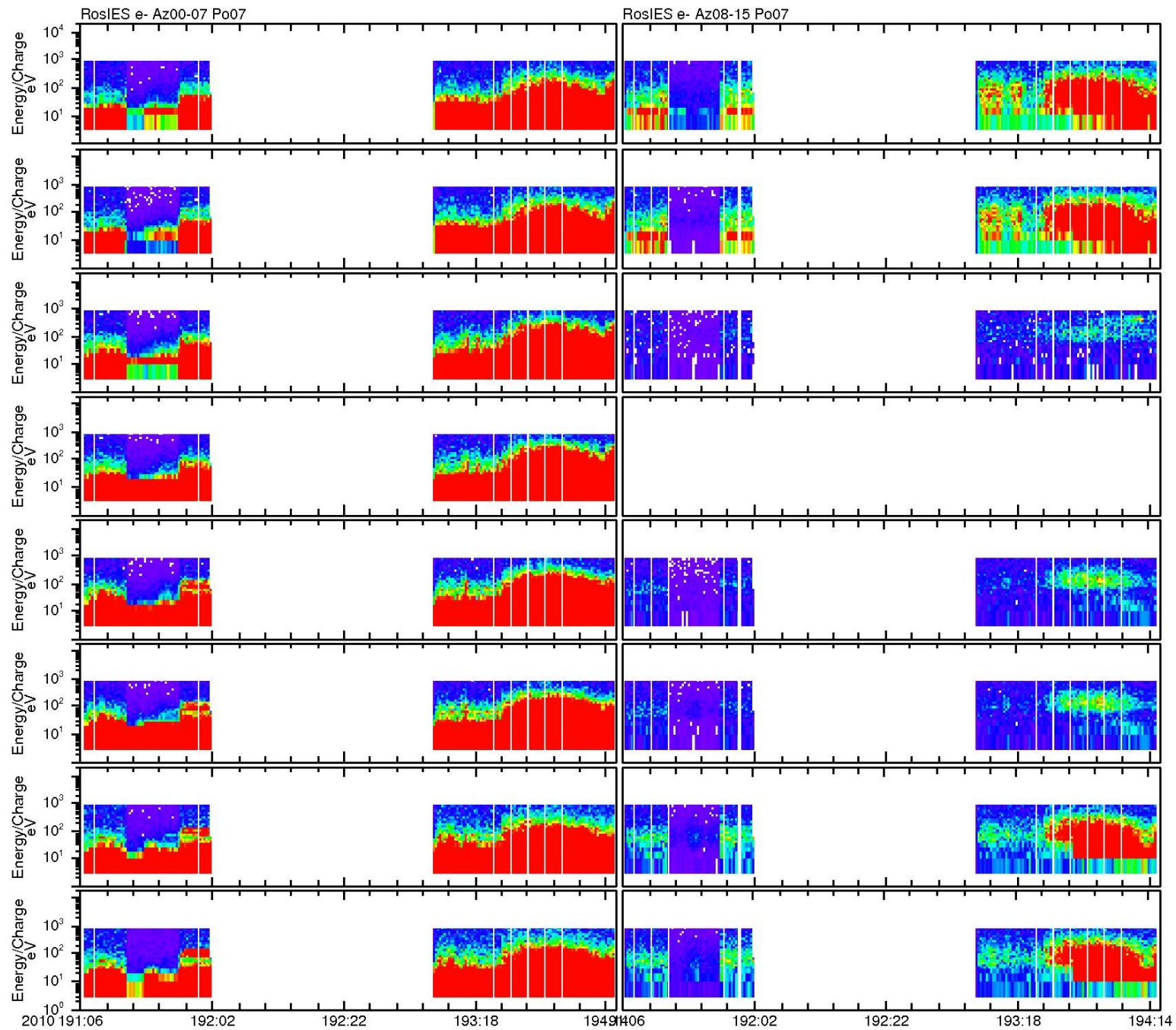


Locate Raw Ion Data (Steins)

- ▶ Solar wind protons should show as an intense line at about 1 keV. No such ions are observed. Hence, IES did not see the solar wind at this time.

ro-a-rpcies-2-ast2-v1.0/data (Lutetia)

Raw Electrons



Raw Electron Data (Lutetia)

- ▶ Used instrument cycle period of 128 sec
- ▶ Assumed energy step is $1/16$ sec = 0.0625 sec
- ▶ Assumed 10% data latency (0.00625 sec) giving a data accumulation period of 0.05625 sec (Not Given in any Documentation)
- ▶ Used energy step values from file in CALIB directory.
- ▶ Labelled azimuth and polar angle values from file in CALIB directory.

Raw Electron Data (Lutetia) DATA Files

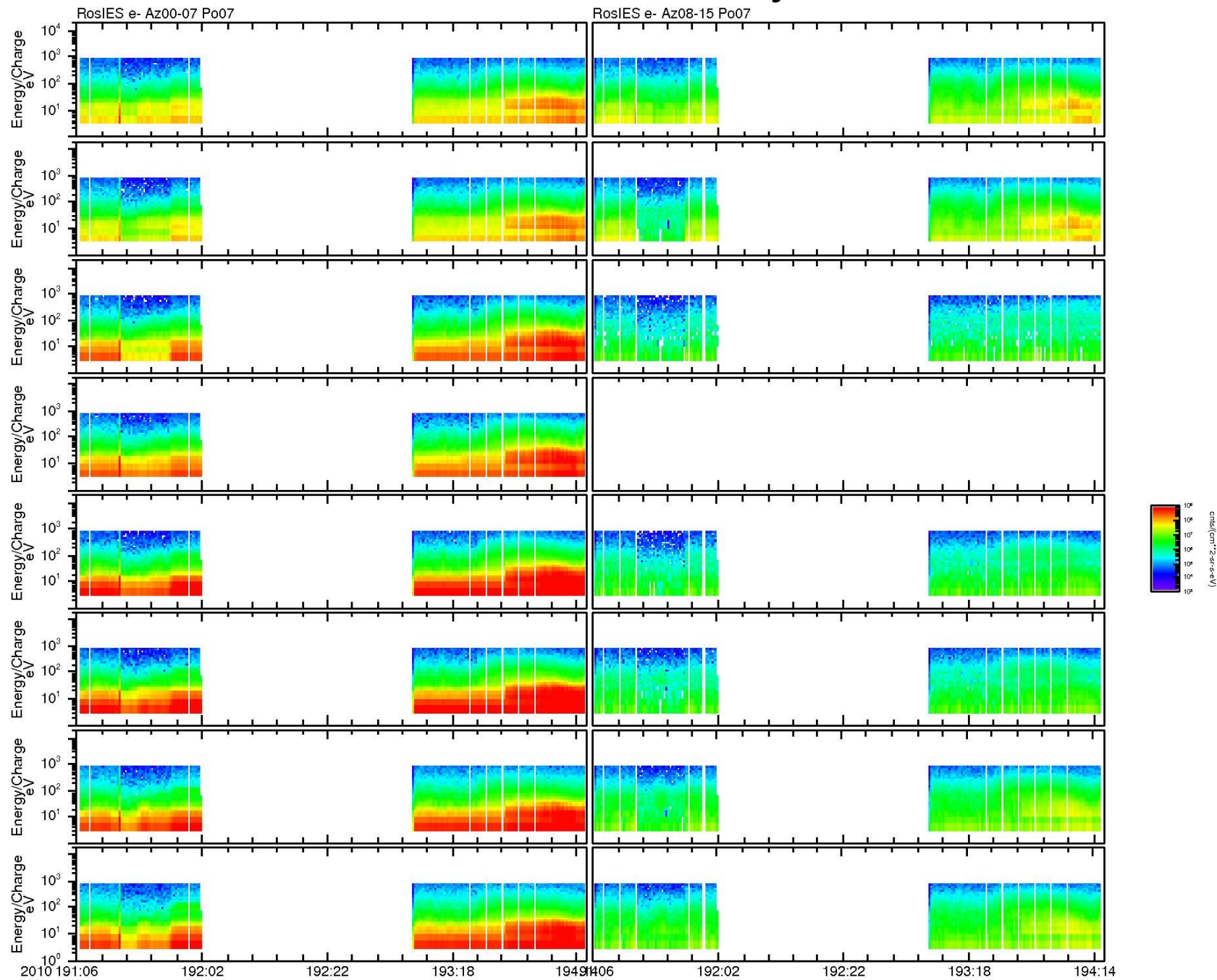
- ▶ RPCIES100710_ELC_V2.LBL OBJECT = TABLE contains ROWS = 37009; however, the corresponding TAB file contains only 37008 rows.
- ▶ RPCIES100710_ELC_V2.TAB contains the mode “3832” not described as part of Appendix A in the EAICD.

Raw Electron Data (Lutetia) DATA Files - Cont. 1

- ▶ RPCIES100711_ELC_V2.LBL OBJECT = TABLE contains ROWS = 21505; however, the corresponding TAB file contains only 21504 rows.
- ▶ RPCIES100712_ELC_V2.LBL OBJECT = TABLE contains ROWS = 21393; however, the corresponding TAB file contains only 21392 rows.
- ▶ RPCIES100713_ELC_V2.LBL OBJECT = TABLE contains ROWS = 14081; however, the corresponding TAB file contains only 14080 rows.

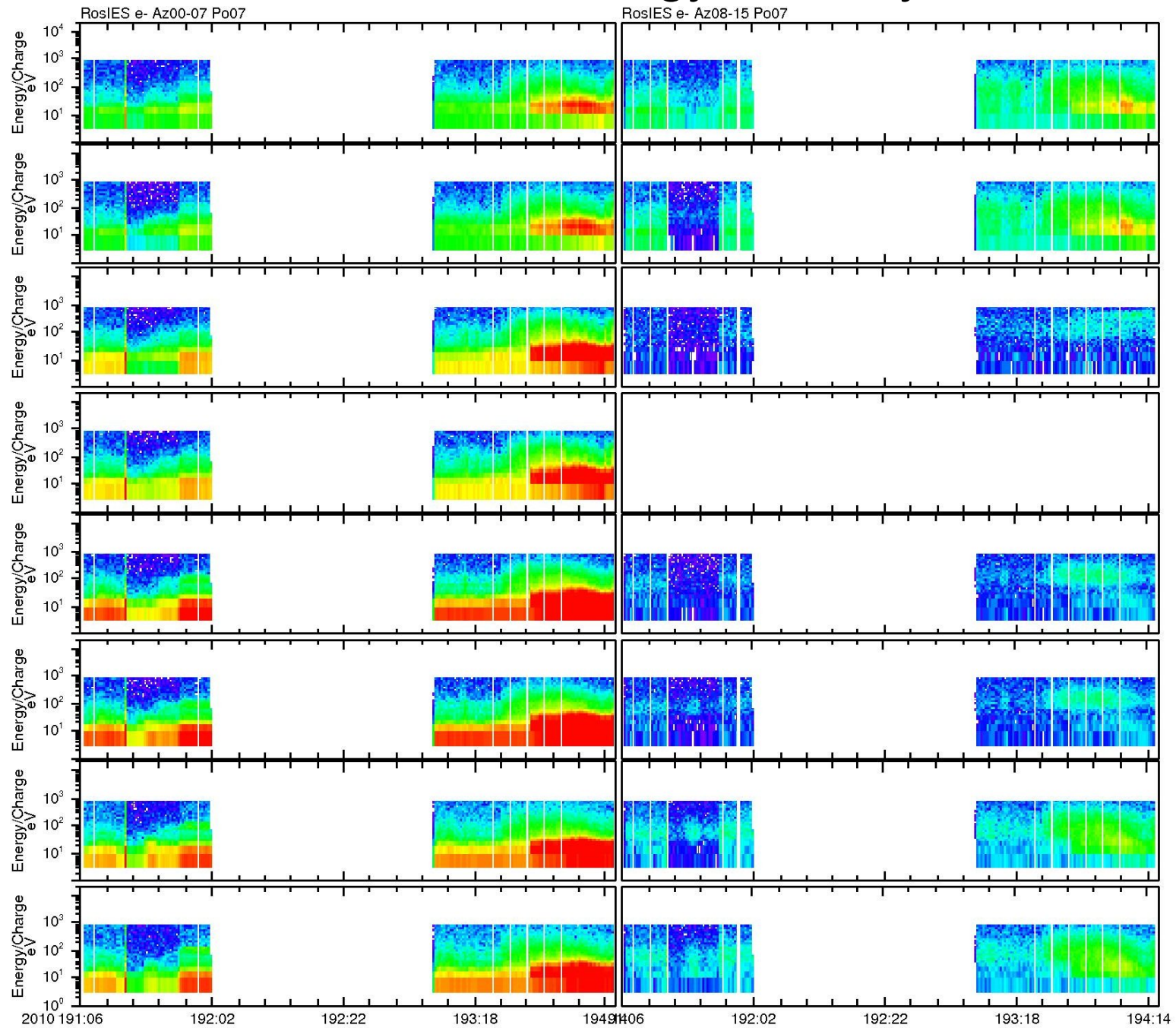
ro-a-rpcies-2-ast2-v1.0/data (Lutetia)

Electron Intensity



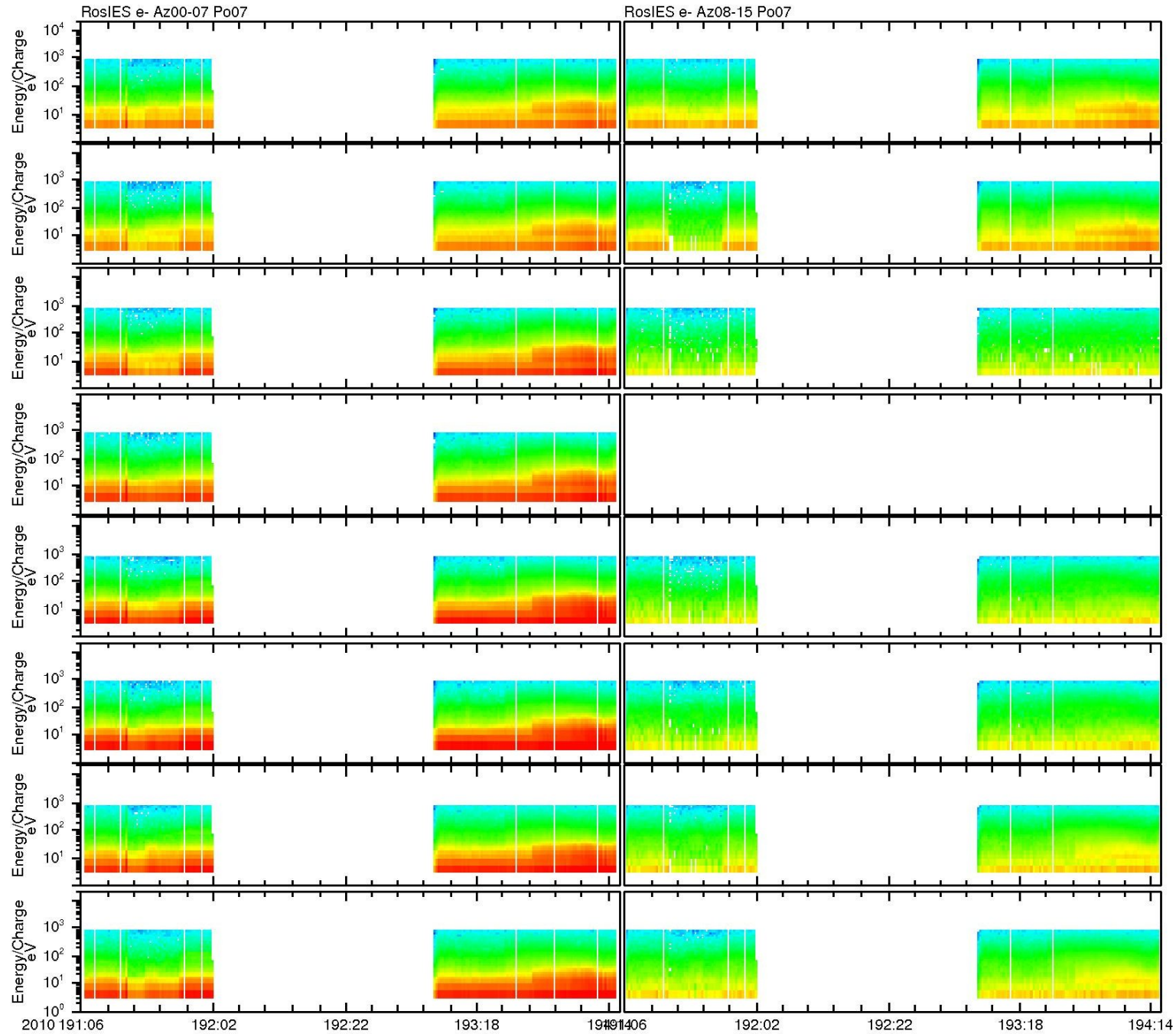
ro-a-rpcies-2-ast2-v1.0/data (Lutetia)

Electron Energy Intensity



ro-a-rpcies-2-ast2-v1.0/data (Lutetia)

Electron Distribution Function



Reconstructed Electron Data (Lutetia)

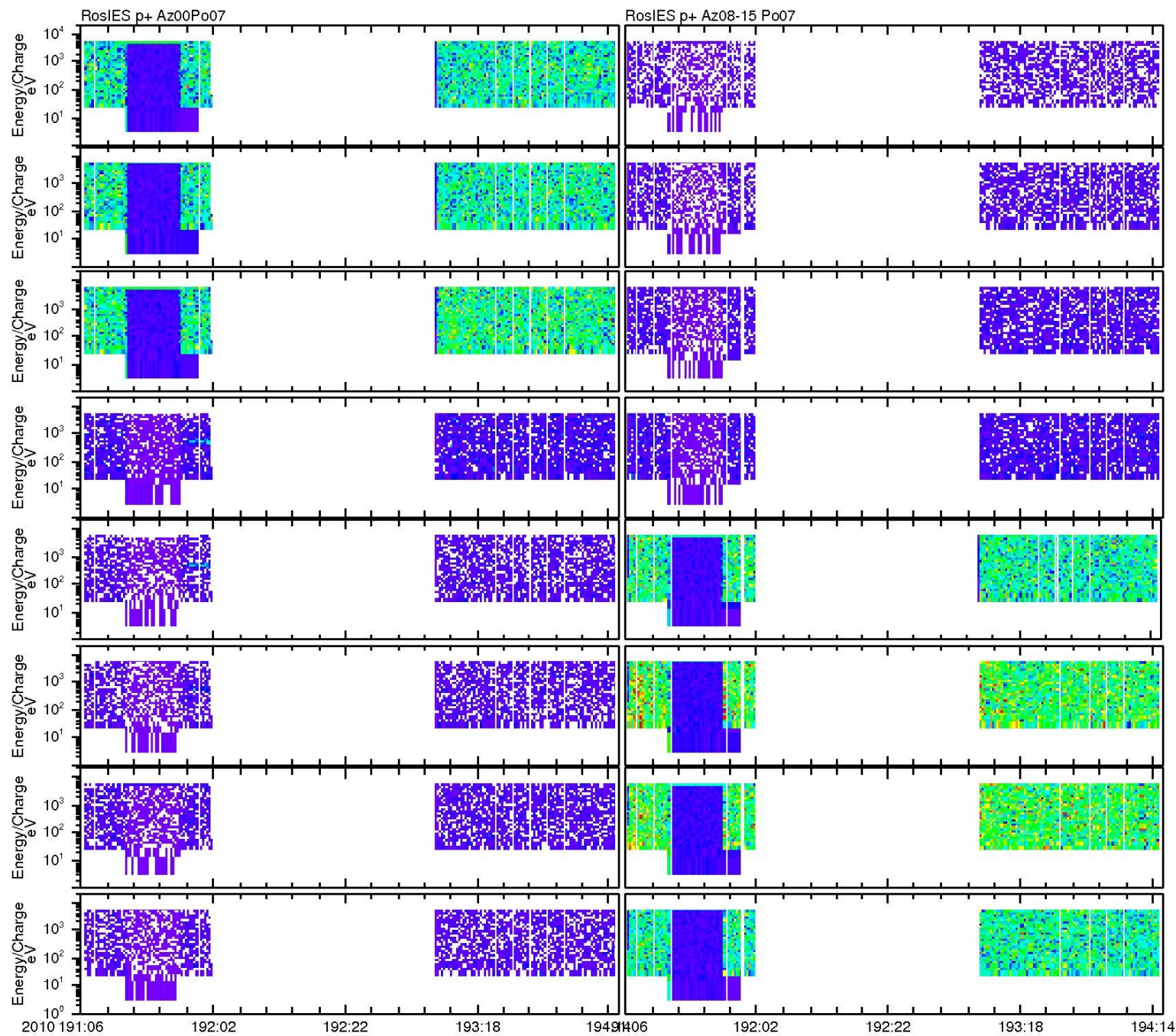
- ▶ Used instrument cycle period of 128 sec
- ▶ Assumed energy step is $1/16$ sec = 0.0625 sec
- ▶ Assumed 10% data latency (0.00625 sec)
giving a data accumulation period of 0.05625
sec (Not Given in any Documentation)
- ▶ Used energy step values from file in CALIB
directory.
- ▶ Labelled azimuth and polar angle values from
file in CALIB directory.
- ▶ Used Energy Resolution of 4% $\Delta E/E$

Reconstructed Electron Data (Lutetia) - Cont. 1

- ▶ Used Electron Geometric Factor of $5 \times 10^{-6} \text{ cm}^2 \text{ sr}$
- ▶ Not Enough Information to Model the MCP Efficiency with a Bordoni Curve (assumed 0.95)
- ▶ Used EAICD Appendix A when possible.

ro-a-rpcies-2-ast2-v1.0/data (Lutetia)

Raw Solar Wind Ions



Raw Ion Data (Lutetia)

- ▶ Used instrument cycle period of 128 sec
- ▶ Assumed energy step is $1/16$ sec = 0.0625 sec
- ▶ Assumed 10% data latency (0.00625 sec) giving a data accumulation period of 0.05625 sec (Not Given in any Documentation)
- ▶ Used energy step values from file in CALIB directory.
- ▶ Labeled azimuth and polar angle values from file in CALIB directory.

Raw Ion Data (Lutetia) DATA Files

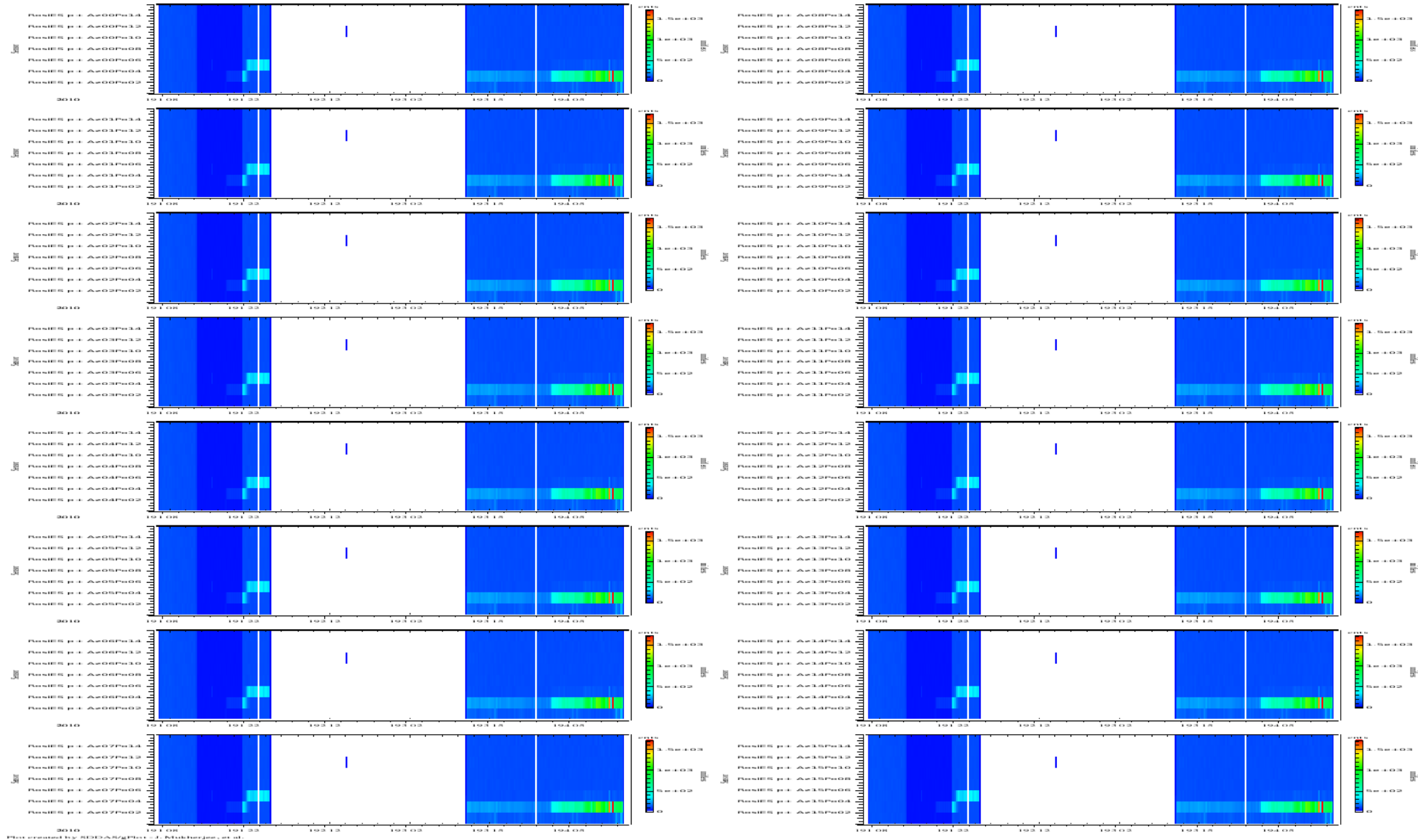
- ▶ RPCIES100710_ION_V2.LBL OBJECT = TABLE contains ROWS = 37897; however, the corresponding TAB file contains only 37896 rows.
- ▶ RPCIES100710_ION_V2.TAB contains the mode “3832” not described as part of Appendix A in the EAICD.

Raw Ion Data (Lutetia) DATA Files - Cont. 1

- ▶ RPCIES100711_ION_V2.LBL OBJECT = TABLE contains ROWS = 21505; however, the corresponding TAB file contains only 21504 rows.
- ▶ RPCIES100712_ION_V2.TAB OBJECT = TABLE contains ROWS = 20881; however, the corresponding TAB file contains only 20880 rows.
- ▶ RPCIES100713_ION_V2.TAB OBJECT = TABLE contains ROWS = 13825; however, the corresponding TAB file contains only 13824 rows.

ro-a-rpcies-2-ast2-v1.0/data (Lutetia)

Locate Raw Solar Wind Ions

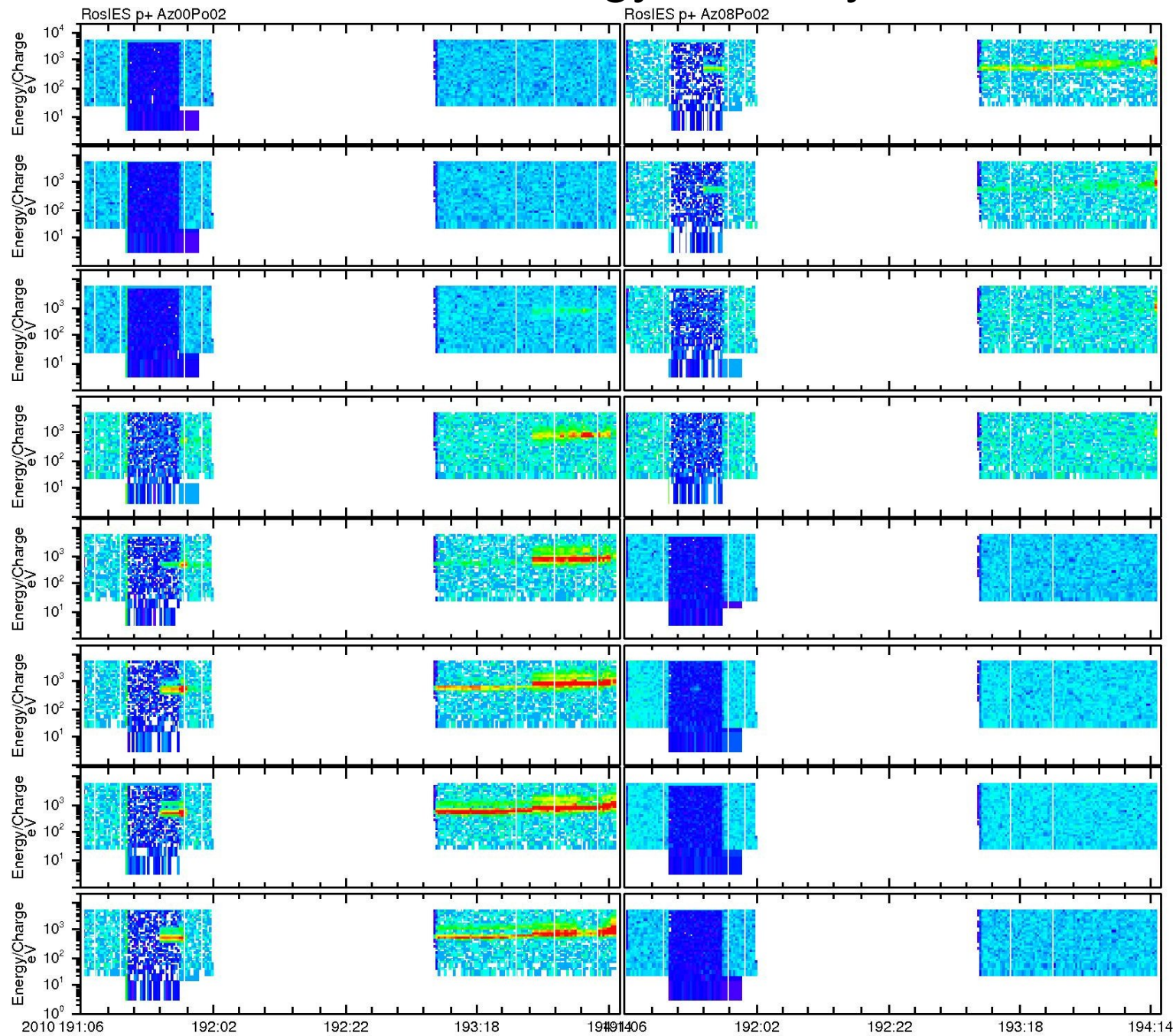


Locate Raw Ion Data (Lutetia)

- ▶ Solar wind protons should show as an intense line at about 1 keV. A strong ion signal is observed at a polar index of 02.

ro-a-rpcies-2-ast2-v1.0/data (Lutetia)

Ion Energy Intensity



Reconstructed Ion Data (Lutetia)

- ▶ Used instrument cycle period of 128 sec
- ▶ Assumed energy step is $1/16$ sec = 0.0625 sec
- ▶ Assumed 10% data latency (0.00625 sec)
giving a data accumulation period of 0.05625
sec (Not Given in any Documentation)
- ▶ Used energy step values from file in CALIB
directory.
- ▶ Labelled azimuth and polar angle values from
file in CALIB directory.
- ▶ Used Energy Resolution of 4% $\Delta E/E$

Reconstructed Ion Data (Lutetia) - Cont. 1

- ▶ Used ion geometric factor of $5 \times 10^{-5} \text{ cm}^2 \text{ sr}$ for a 45° ion sector. Assumed the 5° ion sectors have $(5/9) \times 10^{-5} \text{ cm}^2 \text{ sr}$ geometric factor.
- ▶ Not Enough Information to Model the MCP Efficiency with a Bordoni Curve (assumed 0.95)
- ▶ Used EAICD Appendix A when possible.

Reconstructed Ion Data (Lutetia) - Cont. 2

- ▶ Data mode on 10 July 2010 between about 13:10 UT and about 21:13 UT appears to be in the different mode then reported in the data (“0832”).
- ▶ Data mode on 10 July 2010 between about 20:13UT and about 23:59 UT appears to be in the different mode then reported in the data (“0A22”).

Backup Slides

ro-a-rpcies-2-ast1-v1.0

ro-a-rpcies-2-ast2-v1.0

AAREADME.TXT

GOOD

ro-a-rpcies-2-ast1-v1.0

ro-a-rpcies-2-ast2-v1.0

VOLDESC.CAT

GOOD

ro-a-rpcies-2-ast1-v1.0/INDEX

ro-a-rpcies-2-ast2-v1.0/INDEX

INDEX.LBL

GOOD

ro-a-rpcies-2-ast1-v1.0/INDEX

ro-a-rpcies-2-ast2-v1.0/INDEX

INDEX.TAB

GOOD

ro-a-rpcies-2-ast1-v1.0/INDEX
ro-a-rpcies-2-ast2-v1.0/INDEX
INDXINFO.TXT

GOOD

ro-a-rpcies-2-ast1-v1.0/DOCUMENT
ro-a-rpcies-2-ast2-v1.0/DOCUMENT
DOCINFO.TXT

GOOD

ro-a-rpcies-2-ast1-v1.0/DOCUMENT

ro-a-rpcies-2-ast2-v1.0/DOCUMENT

ANODES/ANODES.LBL

GOOD

ro-a-rpcies-2-ast1-v1.0/DOCUMENT
ro-a-rpcies-2-ast2-v1.0/DOCUMENT
ANODES/ANODES.PDF

GOOD

ro-a-rpcies-2-ast1-v1.0/DOCUMENT

ro-a-rpcies-2-ast2-v1.0/DOCUMENT

GROUND_CALIB/8182-CALPFM-01_R0.LBL

GOOD

ro-a-rpcies-2-ast1-v1.0/DOCUMENT
ro-a-rpcies-2-ast2-v1.0/DOCUMENT
GROUND_CALIB/8182-CALPFM-01_R0.PDF

GOOD

(document resolution could be improved)

ro-a-rpcies-2-ast1-v1.0/DOCUMENT
ro-a-rpcies-2-ast2-v1.0/DOCUMENT
IES_EAICD/10991-IES-EAICD-01_R1.LBL

GOOD

ro-a-rpcies-2-ast1-v1.0/CATALOG
ro-a-rpcies-2-ast2-v1.0/CATALOG
CATINFO.CAT

GOOD

ro-a-rpcies-2-ast1-v1.0/CATALOG
ro-a-rpcies-2-ast2-v1.0/CATALOG
DATASET.CAT

GOOD

ro-a-rpcies-2-ast1-v1.0/CALIB
ro-a-rpcies-2-ast2-v1.0/CALIB
CALINFO.TXT

GOOD

ro-a-rpcies-2-ast1-v1.0/CALIB
ro-a-rpcies-2-ast2-v1.0/CALIB
ELEVATION_STEPS.LBL

GOOD

ro-a-rpcies-2-ast1-v1.0/CALIB
ro-a-rpcies-2-ast2-v1.0/CALIB
ELEVATION_STEPS.TAB

GOOD

ro-a-rpcies-2-ast1-v1.0/CALIB
ro-a-rpcies-2-ast2-v1.0/CALIB
ENERGY_STEPS.LBL

GOOD

ro-a-rpcies-2-ast1-v1.0/CALIB
ro-a-rpcies-2-ast2-v1.0/CALIB
ENERGY_STEPS.TAB

GOOD

ro-a-rpcies-2-ast1-v1.0/CATALOG
ro-a-rpcies-2-ast2-v1.0/CATALOG
INSTHOST.CAT

GOOD

ro-a-rpcies-2-ast1-v1.0/CATALOG
ro-a-rpcies-2-ast2-v1.0/CATALOG
MISSION.CAT

Minor corrections sent to PDS.