MPPE Low Energy Particle Meeting Memo

19 September 2016

0) Confirm agreements @ Previous Meeting

(green characters: new on 20160519)

(1) Definition of Level0-3 data

Level 0 Data

almost raw data (equivalent to “data dump” using QL: SDTP packet is decoded and header is removed)

all the information are included

“without internet access, all the higher level data can be made with this data”

not to be registered to MMO working archive

Level 1 Data : to be released within TBD days after receiving data

made from LVL0 data

de-compressed & decoded data

remove error data -> ex. Checksum error/ automatic correction

multiple files

not efficiency corrected, not background corrected

**CDF format data -> to be registered to MMO working archive : today’s main topic**

can be used for initial data analysis but not for publication

Level 2 Data

made from LVL1 data

calibrated data (it takes some time to provide)

count data (further processed from Level1 Data) + separate efficiency table

back-ground corrected data (UV contamination / background noise etc.)

“efficiency corrected velocity moment” or “ efficiency not corrected velocity moment + separate efficiency table”

velocity moment calculated from 3D data

CDF format data -> to be registered to MMO working archive

to be used for data analysis and publication

differential number flux, differential energy flux, phase space density are added (T.B.C. is approved depending on the version of Level 2 data)

Pitch angle distribution data (at least MEA)

Level 3 Data

higher level data ex. Ion Species – Location Map etc.

cross-calibrated data (ex, HEP+ MEA MIA MSA , MIA <-> MSA )

(2) MEA/MIA/MSA　will have data storage for internal use (starting from MEA1, MEA2, MIA, MSA to be added HEP and ENA).

ISAS, IRAP, LPP, and MPS will have the same MEA1, MEA2, MIA, MSA data. The generated data files are copied every T.B.D. days.

ISAS is responsible for making MIA data files, registering CDF files to MMO working archive. Possibly MGF data will be provided from ISAS??

IRAP is responsible for making MEA1, MEA2 data files, registering CDF files to MMO working archive .

LPP/MPS are responsible for making MSA data files, registering CDF files to MMO working archive.

1) CDF　Data Format of L1 Data

Presentation by Bruno-san

MPPE-LEP preference : 1 file/ 1 Earth day (easy to compare MMO-MPO)

separate file for each data products/rate

possible grouping is considered

<HK data>

1)User HK 128bytes

2) 20bytes HK

3) mission data HK

separate file: all bits will be decoded for self-explanatory

in data cdf files: imited information is included

Ex. mode etc.

Mode information -> Global Attribute

SunPulse: Obs. Start time

TI 4bytes+2bytes or converted total msec/day

IF we can deicide EPOCH

EPOCH is the same as sun pulse (converted to real time)

EPOCH: TT2000

CDF\_file variables from the beginning:

1)EPOCH TT2000

2) Unix\_time : CDF\_CHAR 1dim 128/256

3) Sunpulse : TI 4bytes+2bytes or ex. converted total\_msec

4) some additional information

quality flag: definition will be made in the future

5) data

count data

COUNT[instrument CH][spin\_sector][energy]

COUNT[view direction/pich angle][energy]

COUNT[energy][TOF]

event data (MSA)

EVENT M-mode

A(without event) or E(with event) can be selected

Velocity moment:

Converted to physical value: RELA4

Density (mass included for MSA)

nV (mass included for MSA)

P (mass included for MSA)

(not calculate fluid moments for LEVEL1)

CDF Skelton

CDF　file name?

Ex. Bepi\_mmo\_level\_mppe\_instrument\_productname\_YYMMDD

(may be automatically generated from Global Attribute information)

Separate Files for different data (ex. multiple L-mode data files)?

Integrated files for L-mode/M-mode/H-mode?

Separate file for each data products (grouping is OK)

File unit? 1day or 1rev.?

1 Earth day

1day? Data download date?

Observation date?

Time information?

EPOCH+Unix time+Sunpulse

(These should be discussed @MMO\_SWG in fall 2016. LEP can make request.)

HK　data　in CDF file? No. : separate file

Decoded HK or not decoded HK?

If decoded HK, does 1bit HK have to use 1byte?

2D/3D data array sequence?

Sequence of Items in CDF: Time -> HK -> Data ?

Should be decoded

AI-20160519-1

Bruno-san will make draft Level1 CDF skelton file and send it to MIA, and MEA teams. Due: E. August

2) Action Item Status

<MPPE MODE>

AI-20150415-13

Consider how to use MSA Table E for M-mode data. If additional macro command is necessary, one of the MSA macro commands may be converted to MPPE mode change macro command. -> CLOSE

MSA will use 2 macro commands:

1. Initiate MSA & threshold setup
2. MCP check

Table E: ration of event stream increases

Event stream: used for magnetospheric science

Changing to table-E mode requires 2 commnads. They will be put into one of the MPPE macro commands (one of the 5 MPPE macro-commands) or use two discrete commands.

AI-20150911-1

MSA team will send ISAS the information about 2 MSA macro-commands and commands to change to / recover from table-E mode. -> CLOSE (not necessary: current Mactro Command is OK. For this only two commands are necessary.)

AI-20150415-1

ISAS will send “MPPE DATA MODE ver 2.00 20150413 (After 2nd Integration Test@ISAS)” to MEA/MIA/MSA teams. -> CLOSE

AI-20150415-2

MEA/MSA/MIA teams will check the contents of “MPPE DATA MODE ver 2.00 20150413 (After 2nd Integration Test@ISAS)” and send comments to ISAS by 15 May. -> CLOSE

AI-20150911-2

Y. Saito will start talking with SERENA team in order to mutually understand the operation / data mode. -> CLOSE(MPPE has started talking SERENA at HEWG meeting @ Rovaniemi (submitted data/operation information with other instruments on MMO))

<Data Management>

AI-20150415-3

MSA will test download data from ISAS data server using SDTP.

IRAP will help. -> CLOSE

AI-20150415-4

Level0 data format will be decided by negotiation between ISAS and IRAP.I RAP will transfer the information to LPP. -> OPEN

ISAS made a header file to make MIA Level0 data (see “2) MPPE LEP Data Management”). The detail of the data format (including the necessity of the common information) will be determined through the comparison of CDF skeleton file between the teams.

AI-20150415-5

ISAS will check the requirement on CDF data format (relating with the future conversion to PDS 4.0). -> CLOSE

<status>

Conversion from CDF to PDS4 will be automatically made by a conversion

software, that imposes some limitations on the CDF format. Therefore CDF

should not be made freely.

The structure of CDF should be simple.

Simple time series 2D or 3D data are preferable.

(In this sense, there will be no problem with magnetic field, velocity

moments.

There will be some problem with energy spectra of ions/electrons, when

(for example) energy step number, FOV resolution, observation timing etc.

will change depending on the observation(data) modes.

One possibility is to prepare all the data format into one CDF and put

invalid data to the data for unused data mode or prepare multiple CDF

files (one CDF for each observation(data) mode).

The detail of the CDF->PDS conversion limitation will be informed in the

near future.

AI-20150415-6

IRAP will make proposal about the CDF data format. Based on the information and negotiation between IRAP/ISAS/LPP, the detailed CDF data format will be decided. (MEA, MIA, MSA CDF file format should be similar.) -> CLOSE (Change to a new AI)

Based on the information (two files concerning the requirements to be compatible with PDS4.0; MMS CDF format specification) and the requirements to be compatible with “auto-plot”/SPEDAS, MEA, MIA, MSA teams will make CDF skeleton file for Level1 data and compare / modify the skeleton file. Comparison will star from MSA<-> MIA (CDF file for ion data should have much similarity), then MSA/MIA <-> MEA.

AI-20150911-3

MEA team will circulate MMS CDF format specification document to MSA(LPP), MIA(ISAS). -> CLOSE (each team has the document)

AI-20150911-4

Based on the information (two files concerning the requirements to be compatible with PDS4.0; MMS CDF format specification) and the requirements to be compatible with “auto-plot”/SPEDAS, MEA, MIA, MSA teams will make CDF skeleton file for Level1 data and compare / modify the skeleton file. Comparison will start from MSA<-> MIA (CDF file for ion data should have much similarity: within ~4 months), then MSA/MIA <-> MEA (by next LEP meeting in April 2016). -> OPEN (started comparison between MSA <-> MIA)

AI-20150415-7

ISAS will talk with MGF team about inclusion of MGF data in the “data storage for internal use”. Low time resolution / direction only data will also be OK if the full resolution data is difficult. -> OPEN(not started talking with MGF PI)

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<status>

Y.Saito talked with A. Matsuoka (Co-PI of MGF)

There will be no problem but official request should be sent to the MGF PI in the future.

AI-20150415-8

TI <-> real time conversion is better to be common to MEA/MIA/MSA.

Need further discussion at MMO SWG. -> OPEN (to be discussed @ MMO SWG will be held in Fall 2016.)

<ESTEC TEST>

AI-20150415-9

ISAS will send the participants information to MMO project by 17 April. -> CLOSE

<Initial Check>

AI-20150415-10

MSA team will send HV & LV initial check plan to ISAS by 22 April. -> CLOSE

AI-20150415-11

MEA team will send LV initial check plan to ISAS by 22 April. -> CLOSE

The HV initial check procedure should take into account the data block loss (due to the clock timing difference between MPO and MMO). If data block loss is found, it is necessary to wait for about 30minuts.

MEA will revise HV initial check procedure in order to reduce the risk of high voltage discharge.

In order to reduce the risk of high voltage discharge during the initial high voltage check, high voltage should be powered on with low voltage (in order to heat up and outgass) for some time before start raising high voltage.

AI-20150911-5

MEA will revise HV initial check procedure in order to reduce the risk of high voltage discharge. MEA team will send ISAS revised HV initial check procedure by around 20 Sep 2015.-> OPEN

AI-20150911-6

Each team will check the agreed definition of the Level0-3 data. The definition can be modifies/improved in the future. -> CLOSE

<Others>

AI-20150415-12

MEA MIA and MSA teams will have next data management meeting at SWT meeting in September 2015. -> CLOSE

1. SWT information
2. Venus fly-by?

MIA MSA MEA may be able to turn ON

Wait for FOV analysis by MMO project

1. Launch: April 2018
2. Schedule

MMO SWG will be held around September 2016

MMO Data Level, Data Handling, Data Archivings

５) Other Business

1. support of European MMO team during cruise phase

each team should make the detail of the request clear

ISAS will request to CNES / DLR

French team will request to CNES.

German team will request to DLR.

1. Revise Science Target Document@prposal -> Yes

by next MPPE tutorial @ SWT Italy

AI-20160519-2

MPPE’s Science Target Document@proposal will be revised. ISAS will initiate the revision process. Revision should be finished by next MPPE tutorial @ SWT Italy,

1. Next LEP meeting ?

Twice / year

~Nov. (after SWG)

1. Others

CDPP @IRAP

MPPE database <-> LPP => CDPP

Start discussion @SWG meeting in fall 2016

AI-20160519-3

MPPE data -> CDPP@IRAP will be considered @SWG meeting in fall 2016