|  |
| --- |
| Investigation: FIELDS |
| Progress accomplished this period: | December 2014 Reporting Period |
| 1. | Project Management and Product Assurance |
|  | a. | Project Management* Supported the following PSRs
	+ EDI GDU FM9R
* Delivery of the following flight hardware items from UNH to GSFC
	+ EDI GDU FM9R
* Began preparation of cost and staffing estimates for enhanced support of Phase E activity.
* Reviewed changes to ITAR restrictions
* Discussed plans for a RFP to complete Phase D
* CDRL submission
	+ CDRL 69: FIELDS Instrument Users Manual
 |
|  | b. | Product Assurance |
|  |  | Turco / Salwen* EDI FM9 TV test support
* EDI FM9 TVAC testing support.
* EDI FM9 cleaning/inspection and packing.
* DPA report on three sample UNH HVOCs from life testing submitted. All results were acceptable.
 |
| 2. | Systems Engineering  |
|  |  | Rau, Dors, Needell* Supported EDI GDU SN09R testing with TV, Magnetics, and Acceptance
* Attended EDI GDU SN09R PSR
* Release of FIELDS Instrument Users Manual
* Submitted final FIELDS verification material with EDI GDU SN09R
 |
| 3. | Post-Delivery Support (UNH) |
|  |  | Observatory and Commissioning Planning Support (FIELDS)* Performed additional final ADP RE inspections for OBS1 +Z, OBS2 -Z due to destack operation.
* Removed all SDP Sensor Safety GSE from OBS1-4 to prepare for launch
* Supported MRT20 and all contingency planning
* Prepared and released EDI SN09R WOA for install work at Cape
* Delivered and integrated GDU SN09R onto OBS-4 Bay 8 at Astrotech
* Continued supporting commissioning planning discussions with SOC
* Continued I&T planning for FIELDS at the OBS level for Cape Ops
* Continued reviewing all test data from previous OBS tests
 |
|  |  |
| 4. | Science and Science Data Processing  |
|  |  | SWT and SWG * Participation in all science planning discussions.

Science data processing activities (Compiled by Chutter)* ALL
	+ Continued working on software to run at SDC
* UNH
	+ Working on sample timing – Burst DCE/DCV/SCM still needs work
	+ Incorporated calibration from LPP to make first L2 BPSD product
	+ Continued development of FIELDS real time displays – adding features and flexibility
	+ Worked on combined B product software (with Cluster data)
	+ Worked on combined E product software (with Cluster data)
* LPP
	+ Data variables are now compressed using GZIP
	+ Software that computes the calibration factor for DSP-SCM spectra has been written.
* UCLA
	+ Continued bi-weekly mag team telecons to develop calibration data flow, and magnetic conference procedures
	+ Installed Mag Level 2 software at UCLA
	+ Met with GSFC team to discuss data reduction software, including calibration data.
	+ Developing inflight calibration procedures
	+ Work continues on inflight calibration and procedures
	+ Comments received from Prof. Russell on magnetometer team meeting report generated by R. J. Strangeway, B. J. Anderson and J. Slavin. Include identifying who should respond to RFAs and timeline for responses
* GSFC
	+ Installed Mag Level 2 software at UCLA
	+ Met with UCLA team to discuss data reduction software, including calibration data.
	+ Tested LANL GeoMag installation at SDC. Failed to get my test program to link. The correct versions of dependencies seem to be missing
	+ Worked on smoothing algorithms for attitude data.
	+ Generated simulated mag L1A data that shows nutation, using simulated attitude/ephemeris from FDOA.
	+ Began work on data overlap removal.
	+ Worked on routine to pre-process L1A data for the orthoganalization calibration process.
* IRFU
	+ Switched to a newer version of NASA CDF patch for Matlab which improved writing CDF files containing TT2000 time variables – CDF team has provided several enhancements
	+ Improving software to produce Level 2 DCE and DCV data
* LASP
	+ Working on ADP software
 |
|  |  |  |
| 5. | Magnetometers |
|  | a. | DFG  |  |
|  |  |  | * Continued science data processing preparation activities
 |
|  | b. | AFG |  |
|  |  |  | Pre-launch Preparations* Louise Lee converting analysis software to Python.
* Hannes Leinweber and Ken Bromund had a meeting at UCLA to discuss data reduction software, including calibration data. Also installed and tested the L2 processing software on a UCLA server (apollo). Set up a versioning system (GIT) on apollo.
* Prepared a budget and level of effort table for the Mag team Phase E activities to be submitted by UNH as part of the Phase-E budget enhancement request.

Post-launch Preparations* Continuing to assess effort requirements to develop and maintain calibration system.

Engineering: Post-delivery Activity* Watching over activities in assessing LM6142.
 |
|  |  |  |  |
|  | c. | SCM | * Continued science data processing preparation activities
 |
|  |  |  |  |
| 6. | EDI |
|  |  | Ship Set 4 - GDU SN9R* Detector Characterization
* TV Test
* Magnetics Testing
* Installation of GeBK tape
* FIELDS Acceptance Test
* Cleaning & Bagging
* PSR
* Shipment to Cape

Ship Set 4 - GDU SN8 (now flight spare)* Returned to UNH

Flight Software* Started implementation of Gun HV ramping and Gun parking option
* Continued testing of electric field mode
 |
|  |  |  |
| 7. | SDP (KTH, UNH) |

|  |  |  |
| --- | --- | --- |
|  |  | * Support commissioning planning activities.
 |

|  |  |
| --- | --- |
| 8. | ADP |
|  |  | LASP ADP Post-Delivery Support Activities * Supported MMS IS I&T planning teleconferences
 |
|  |  |  |
| 9. | Commissioning and Mission Operations (Needell) |
|  |  | * Released final FIELDS Users Manual
* Prepared and delivered FIELDS Training presentation to SOC for Jan Training meeting
* Continue testing scripts with SOC
* Participated in MRT 20 (Early ops)
 |
|  |
| 10. Problems encountered and updates this period |

|  |  |  |
| --- | --- | --- |
|  |  | None |

|  |  |  |
| --- | --- | --- |
|  |  |  |
| 11. Issues and Concerns |
|  |  | Science Data Processing Issues (Compiled by Chutter)* GSFC
	+ Definitive attitude has jitter on phase as well as pointing direction: need to determine if the level of noise introduced is acceptable. Need to determine if LANL needs to smooth data for their higher level products.
 |

|  |
| --- |
| Activities planned for next reporting period |
|  |  | Management |
|  |  |  | * Anticipating a RFP for the balance of Phase D. Extend RFPs to FIELDS subcontractors. Begin proposal preparation.
 |
|  |  | Product Assurance, Configuration Management, Parts, Materials, Facilities |
|  |  |  | Turco/Salwen* Support project as needed
 |
|  |  | Systems Engineering & FIELDS I&T |
|  |  |  | Rau, Dors, Needell* Return GDU SN08 to UNH to be used as flight spare
* Prepare for and listen to Webex of MMS SOC Training
* Process S/C current measurements for magnetic emission analysis
 |
|  |  | Post-Delivery Support (UNH) |
|  |  |  | Observatory and Commissioning Planning Support (FIELDS)* Continue FIELDS preparations for flight and early orbit operations with focus on real time data analysis plans to cover deployments, health and safety and interference
* Continue contingency planning
* Continue review of commissioning planning material on SOC website
* Continue I&T planning for FIELDS at the OBS level with focus on Cape
* Final Inspections of ADP RE on OBS-2 +Z and OBS-3 -Z prior to final stack
* Final Inspections of ADP RE on OBS-4 +Z and OBS-1 -Z prior to fairing install
* Final VIF testing prior to launch
* Final FIELDS inspections on all OBS prior to launch
* Red tag removal of all covers on EDI GDU prior to launch
 |
|  |  | Science |
|  |  |  | SWT and SWG* Support science telecons as needed

Science data processing plans * ALL
	+ Work on INITIAL versions of software by end of January (did not meet December goal)
	+ Use SPDF tools to verify CDF and skeleton files follow MMS CDF Guide
	+ Support SODAWG
* UNH
	+ Work on real time data display for SDP deployment
	+ Incorporate calibration from LASP to make first L2 EPSD product
	+ Continue working on EDI E Field interfaces
	+ Work on RunEst software (for E Field and mag spin axis calibration)
	+ Continue work on scripting to control processing
	+ Continue L0 to L1 software updates as necessary
	+ Continue working on combined E and B products
	+ Work on error and warning management
* LPP
	+ [in progress] Analyze the results of the MRT9 data test and correct the software where needed.
	+ [in progress] Test further the SCM calibration software with the new SCM L1A CDF files provided by M. Chutter in Mag123 system (see MRT9 data test).
	+ [in progress] Include CDF version number computation (vX.Y.Z) - SDC provided us with the software/procedure to inquire MMS database in order to know which version of the same data in the latest. This has to be implemented in SCM software.
	+ L1B data will be delivered in both SCM123 and OMB reference frames as decided on the data processing group meeting, Iowa, March 2014
	+ Include coordinate transformation from mechanical frame OMB to GSE in L1BtoL2
	+ [in progress]Test DSP spectra calibration.
* UCLA
	+ Continue developing in-flight calibration procedures
	+ Continue converting analysis activities
	+ Continue working on timing corrections
	+ Generate responses to amended RFAs from the Mag team meeting
	+ Expand on the calibration data flow as outlined during the MMS SWT and FIELDS meetings
* GSFC
	+ Demonstrate the calibration process (Orthogonalization) as input to Mag Conference and next level of Mag calibration
	+ Provide additional sample data, as necessary.
	+ Continue work with LANL and DSWG to create attitude/ephemeris data product and transformation software.
	+ Work on fully functional L2pre software: finish DMPA-GSE transformation.
	+ Modify L2pre software to handle data overlap, fine timing corrections.
	+ Update Level 2 calibration document to document decisions from the SWT Meeting: timing corrections; plans to modify calibration file: add uncertainties and temperature correction coefficients.
* IRFU
	+ Implement initial version of SDP offset files
	+ Release new version of Level-2 files for MRT9
* LASP
	+ Continue improving DCE software
	+ Write the software that gives the calibration factor for a given bandwidth in order that Mark Chutter can calibrate E spectra.
 |
|  |  | Mag Team (UCLA) |
|  |  |  | * Restart bi-weekly Mag team telecons.
* Continue developing inflight calibration procedures.
* Continue data analysis software activities.
* Generate responses to the amended RFAs from the Mag team meeting
* Expand on the calibration data flow as outlined during the MMS SWT and FIELDS meetings.
* Verify end-to-end data flow from SDC to Mag team home institutions.
* Gather Phase E Statements of Work for Mag team members.
 |
|  |  |  |  |
|  |  | EDI |
|  |  |  | Commissioning* Generate and provide scripts for EDI HV commissioning

Flight Software* Continue implementation of Gun HV ramping and Gun parking option
* Continue implementation and testing of electric field mode
 |
|  |  |  |  |

|  |  |  |
| --- | --- | --- |
|  |  | SDP (UNH, KTH/IRFU) |
|  |  |  | * Support commissioning planning activities
 |

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  | ADP/SDP/DSP (LASP) |
|  |  |  | ADP* Support ADP RE inspections as needed.

Systems and Program Management* Support project as needed.
 |
|  |  | Commissioning and Mission Operations (Needell) |
|  |  |  | * Present FIELDS Training materials at SOC
* Finalize CSTOL scripts at SOC
* Update FIELDS Command/Telemetry Database for CTDB 8.0 release
 |
|  |  |  |

\*\*\* end \*\*\*