Helioseismic and Magnetic Imager

Stanford University

Contract NAS5-02139

Progress Report for April 2005

Introduction

The Helioseismic and Magnetic Imager (HMI) investigation proposal was submitted to NASA on 24 April 2002 in response to the Solar Dynamics Observatory Announcement of Opportunity AO 02-OSS-01, and this investigation was selected by NASA on 15 August 2002. The contract (NAS5-02139) between NASA and Stanford University was in place as of 27 September 2002. That contract has been modified (via Modification #13) to extend through Phase-E at launch plus 30 days plus six years with the launch expected in 31 August 2007. To date the contract has been modified 22 times.

We have submitted a proposal for the additional effort needed to extend the launch date to 30 April 2008. We expect the launch delay modification to be negotiated in the next few months possibly with an additional two months effort just after launch to bring our contract into alignment with the 90-day checkout time planned for the mission, not to mention the expected RFP to extend the launch date to late summer 2008.

We have received a draft SOW for a proposal to support the HMI-AIA Joint Science Operations Center enhancements of the original HMI SOC tasks. We have submitted comments to the Project and await a request for proposal. We are proceeding with development of the JSOC and support of AIA development under the verbal assurance that NASA approves of the plan.

The development of the HMI flight instrument is subcontracted to the Lockheed Martin Space System Company at its Lockheed-Martin Solar and Astrophysics Laboratory (LMSAL) in Palo Alto California. The monthly progress of the LMSAL subcontract is reported in parallel with this report and is considered to be an attachment to this report. The monthly report for E/PO activities is also attached to this report. All monthly reports are available at http://hmi.stanford.edu/Status_Reports/.

Status and Activities during April.

Both Stanford and Lockheed personnel have participated in weekly SDO instrument interface, ground system, and individual instrument team teleconferences.

The SU team supported regular Weekly HMI meetings at the LMSAL facilities including the regular weekly status meeting and topical design meetings in areas including mechanical, optics, thermal, electrical, software, CCD cameras, and others as needed.

The Stanford personnel responsible for the HMI instrument performance (R. Bush and J. Schou) continued work on understanding the optical, thermal, and filter performance for the HMI filter oven and front window and blocking filters to assist LMSAL. Additional

work continued in the form of technical discussions of the Michelson Interferometer development with LMSAL personnel to support the subcontract (from LMSAL) with Light Machinery in Canada. Additional work continued in the form of discussions and management activities on the CCD camera systems for both the development and flight camera systems for both HMI and AIA in support of the LMSAL activities. J. Schou is leading an effort to develop calibration sequences to be used in the first HMI optical box stimulus telescope and sunlight tests this coming fall. Sebastien Couvidat has joined the work preparing for calibration activities. Calibration planning meetings are now on a semi-regular weekly schedule.

After the HMI Science Team meeting on 26, 27 January we sent all the US Co-Is instructions for revised proposals for their travel to team meetings and code-porting efforts. We have now received proposals from the Co-Is and are in the processes of getting the subcontracts in place with the minimum possible funding for FY05 with additional funding planned for early FY06.

Significant progress has continued in the development of the Storage Unit Management System (SUMS). The core SUMS system is now running and being installed on the new database machine and LWS computer to be available for use in DRMS testing. The SUMS API has been released. The Data Record Management System (DRMS) is now functional at the rudimentary level (server side) with work progressing rapidly on the user interface library. The basic keyword and data segment library is implemented and being tested. The JSOC prototype hardware is complete and will be used to test and validate the design concepts of the SUMS and DRMS in the coming months. The SGI next system update release we have been waiting for is now released but not yet delivered to us.

The flight unit data EGSE (HMI-2, AIA-2) machines have all arrived, along with the 64-bit replacements for HMI-0 and AIA/HMI-1. The OS has been installed on HMI-2 with others to follow in May. The goal is to deliver these to LMSAL by the end of May – well before they are needed.

We prepared presentations to support the SDO Ground System CDR scheduled for the second week in May.

The construction of the new Varian-II Physics building (now called the Physics and Astrophysics Building) is progressing. We have initial space allocations in this building sufficient for about 1/3 of our office needs. Work is continuing on identifying the additional space we need. The Dean of Research had identified Stanford funds to ensure the necessary on-campus facilities can be provided. The needed Stanford “Form-1” is in process so actual work to determine a new location for our facilities can actually begin! We still expect to move into some of the space in Jordan Quad that will be available after the ITSS department moves off campus early next year. The planned demolition schedule for our present building is still set for mid 2007.

Planned Activities for May

We will participate in the SDO Ground System CDR in the second week of May.

We are continuing the study of the impact of the funding postponement for the rest of FY05.

We expect the SUMS/DRMS initial system to be operational on the JSOC prototype hardware.

We expect to have an IT security plan draft complete and delivered to SDO before the SDO ground system CDR in May. Some details will need to be modified after the referenced documents are available.

The planning for HMI optical calibration will continue, as well as a detailed analysis at the module level of software needed to accomplish the HMI standard high level data products.

Near-term Milestones

1 January 2005	Decision on space location within Stanford for the JSOC and Stanford HMI team facilities. ***This is finally beginning to happen.***
15 May 2005	Co-I subcontracts in place with funding at a minimum value.
31 May 2005	JSOC SUMS and DRMS API available for test.
June-July 2005	Deliver updated EGSE HMI/AIA-2 and 64-bit HMI/AIA-1 to LMSAL

Attachments

Lockheed Martin Solar and Astrophysics Laboratory HMI progress report and the HMI/AIA EPO progress report for April are attached. This report, the LMSAL report, and EPO reports are also available at http://hmi.stanford.edu/Status_Reports for convenience.