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 are re-costing the original launch delay proposal and developing the details for costing the new 4-month delay and the support of AIA data processing and EPO. Our goal is to be finished with this proposal in response to a shortly received RFP by late August.

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/](http://hmi.stanford.edu/Status_Reports/).

Status and Activities during May.

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 filter 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 is continuing work preparing for calibration activities. Calibration planning meetings continue on a semi-regular weekly schedule (most Fridays at 4 PM).

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. Several of the subcontracts are in place and others are moving through the process.

Significant progress has continued in the development of the Storage Unit Management System (SUMS). The core SUMS system is now running and has been installed on the new database machine and LWS computer to be available for use in DRMS testing. The SUMS work now has shifted to the development of the tape archive system. The Data Record Management System (DRMS) is now functional at the rudimentary level with work progressing rapidly on the user interface library. The basic keyword and data segment library is implemented and being tested. We are developing plans for intensive testing to occur during the summer. The SGI next system update release we have been waiting for is 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 HMI/AIA-1 replacement machines had the software installed and have been delivered to LMSAL.

We attended the SDO Ground System CDR in the second week in May. Several members of the Stanford HMI team also attended the AAS SPD & AGU meeting in late May. For some of the Stanford HMI team (Scherrer, Schou, Larsen, Couvidat) these activities consumed most of their HMI effort for 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. We have lost ground on this effort. The prior plan to move to facilities in the area known as Jordon Quad have proved unworkable once Stanford realized that the present occupants of Jordon Quad will not be moving to their new quarters for at least three more years. Several options are being pursued and a new plan of choice will be determined later in June or early July.

The draft IT security plan was delivered to Mike Scott in May. We will discuss this soon to see if it is suitable for the submission due 90 days after contract mod 13.

**Planned Activities for June**

We are continuing the study of the impact of the funding postponement for the rest of FY05. We will begin detailed work on the combined proposal to cover the original 8-month launch delay, the JSOC, the 2-month flight phase extension, and the new 4-month
delay in launch with funding limits for FY05 and FY06. The goal is a draft proposal by end of July with submission to NASA before September.

We expect the SUMS/DRMS initial system to be tested on the JSOC prototype hardware with plans underway for extensive testing.

We expect progress on including the housekeeping packet simulation and unpacking in the EGSE system.

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 July 2005  All Co-I subcontracts in place with funding at a minimum value.

31 July 2005  JSOC SUMS and DRMS testing of record management well along.

31 July 2005  Deliver updated EGSE HMI/AIA-2

**Attachments**

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