

**Outline of Academic Activities during the JSPS Fellowship
Period from 22/10/2013 to 20/12/2013 (Short-term) at
ISAS/JAXA**

The research objectives during the Japan Society for the Promotion of Science (JSPS) fellowship include to define the interface requirements on the Teledyne imaging sensors (see Figure 1) HAWAII-2RG (H2RG) Infrared (IR) camera for spacecraft and to investigate the image processing aspect of the Solar-C mission as a part of Solar Ultra-violet Visible and IR Telescope (SUVIT). Therefore, it is timely to conduct the research activities at the Institute of Space and Astronautical Science (ISAS)/Japan Aerospace Exploration Agency (JAXA). Since the Solar-C mission requires a sophisticated telescope capable to capture solar images for

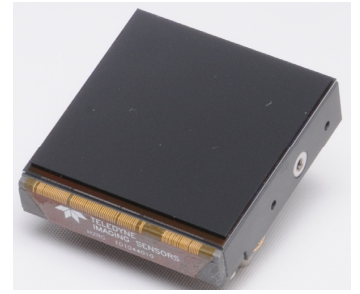


Figure 1 H2RG IR sensor

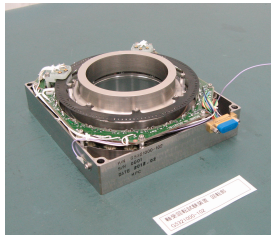


Figure 2 PMU

wavelengths from 525nm to 1083nm including visible and near IR. Using a Polarization Modulator Unit (PMU) in front of the telescope, it can act as a demodulation for the H2RG IR detection. Figure 2 shows PMU for SUVIT under development at ISAS/JAXA. This mechanism continuously rotates a waveplate in the light from the telescope. Note that an aluminum dummy is installed instead of the

waveplate in the photo. This mechanism is now operating in vacuum chamber for life test. Having the sensor, PMU, SIDECAR (see Figure 3), SpaceWire and Field Programmable Gate Array (FPGA) ready for the development, the following research activities were conducted:

- To discuss and present the current status of Solar research activities at Mullard Space Science Laboratory (MSSL).
- To analyse the characteristic of PMU.
- To obtain the simulated Stokes data for the FPGA development.
- To study the interface between the SIDECAR Application Specific Integrated Circuit and J-side Spectro-Polarimeter (SP) Electronics via the FPGA.
- To determine the critical functionality of demodulation and to define the high-speed algorithm for the demodulation.
- To understand the different observation modes of SP.
- Documentation and reports.



Figure 3 SIDECAR

Solar-C Science Meeting and Hinode-7 Meeting

During the meetings on 11-15 November 2013, a PMU for polarization of solar activities was demonstrated by Hida Observatory, Kyoto University. A Domeless Solar Telescope (DST) performed the high-resolution observations of Solar surface. The DST has the highest spectral resolution SP for measuring the polarization of light, the strength and direction of the solar magnetic field.



Figure 4 Group photograph of Solar-C Science Meeting and Hinode-7 Meeting

Acknowledgment

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