an increase in aperture and/or in number of optical elements within the system. However, in practice, the alignment of multiple optical components tends to be rather difficult task because of the multiple coupling effects among the elements within the target system. In order to understand and hence identify the complex interplay of the wavefront coupling effects from the alignment process, the original differential wavefront sampling(DWS) method was presented elsewhere in recent years. DWS uses partial differential of the wavefront of optical component and perturbation value of the optical component against a particular alignment factor. The straightforward application of DWS for an off-axis optical system revealed that it tends to give incorrect estimation of the given misalignment state. In this study, we added off-axis correction terms to the original DWS algorithm and investigated its alignment performance. The performance simulation result for a Korsch type space optical system shows that the modified DWS is capable of bringing the misaligned system into the target alignment tolerance only after 3 iterations. It also shows that this new improved algorithm can be used to estimate the source misalignment as well. We are planning to apply this method for the alignment of a 800mm Korsch type telescope in the near future. We discuss the computational technique, simulation results and implications in details.

[V-2-4] Development of an Earth Observation Optical Payload Simulator

Jong-hoon Lee[1], Jun Ho Lee[1], and Yee-Jin Cheon[2]

[1]KongJu National University, [2]KARI

The importance on the simulation of earth observation optical payloads has been recently emphasized in order to estimate on-orbit imaging performance of the payloads. The estimation should consider all aspects of payload development; design, manufacture, test, assembly, launch and space environment. Until recently several studies have been focused the evaluation of the individual factors rather than the integrated. This paper presents the development of an integrated payload simulator. The simulator analyzes the payload imaging performance based on MTF(Modulation Transfer Function) calculations of the major factors (Diffraction, Aberration, Detector integration, Image motion and etc.) and the simulator can generate realistic artificial earth images as taken by defined earth observation payloads. The simulator is developed for the use of evaluating pre- and post-launch imaging performance and assisting on-board calibration of COMPSAT-3.

[V-2-5] Radiometric performance characterization for breadboard AMON-RA energy channel instrument for deep space albedo measurement

Kiljae Jung[1], Dongok Ryu[1], Ki-Beom Ahn[1], Eun-song Oh[1], Jae-Min Lee[1], Yunjong Kim[1,2], Jinhee Yu[1], Hyun-Su Yi[2] , Sun-Jung Ham[1,3], Ji-Yeon Yoon[4], Hoseop Yoon[1,4], Jin-Seok Hong[5], Ho-Soon Yang[2], Byong hyok Chon[2], Hae-Sook Hwang[8], Hanshin Lee[3,6], Sug-Whan Kim[1], and Mike Lockwood[3,7]

[1]Dept. of Astronomy, Yonsei University, Seoul 120-749, Korea, [2]Korean Research Institute of Standards and Science, Daejeon 305-340, Korea, [3]Rutherford Appleton Laboratory, UK, [4]Korea Astronomy and Space Science Institute, Daejeon 305-348, Korea, [5]I&A Technology, Sungnam 463-500, Korea, [6]Astronomy sub-dept. University of Oxford, UK, [7]Space Environment Physics Group, School of Physics and Astronomy, University of Southampton, UK, [8]Dept. of Applied Chemistry, Daejon University, Daejon 305-380, Korea

The Albedo MONitor and RAdiometer (AMON-RA) instrument system is designed to measure Earth global albedo anomaly over the wavelength range of 0.3um to 4um. The instrument consists of two interconnecting optical subsystems i.e. a visible channel and an energy channel. The energy channel instrument consists of a modified Winston cone, a couple of relay mirrors and a pyro-electric detector. First, we report the integration and alignment process, leading to the prototype bolometer instrument. We then discuss the radiometric performance characterization including laboratory measurement results and the future plan for further incorporation of the bolometer instrument into the prototype AMON-RA instrument.

■ Session VI-2 : Satellites 2

Thursday, 23 October [11:25-12:25]

[VI-2-1] Development of Hardware-in-the-loop Simulator for Spacecraft Attitude Control using thrusters

Dong-Wook Koh, Sang-Young Park, and Kyu-Hong Choi

Astrodynamics & Control Lab, Department of Astronomy, yonsei University, Seoul 120-749, Korea

The ground-based spacecraft simulator is a useful tool to realize various space missions and satellite formation flying in the future. Also, the spacecraft simulator can be used to develop and verify new control laws required by modern spacecraft applications. In this research, therefore, Hardware-in-the-loop (HIL) simulator which can be demonstrated the experimental validation of the theoretical