fundamental researches regarding the essential parts of KASIOPEA has been done by author. The numerical integration module of the KASIOPEA is the most sensitive part in the precision of the final output in general. There is no silver bullet in the numerical integration in an orbit propagation as a non-stiff ODE case. Many numerical integration method like single-step methods, multi-step method, and extrapolation methods have been used in overly populated orbit propagator or estimator. In this study, several popular methods from single-step, multi-step, and extrapolation methods have been tested in numerical accuracy and stability.

## ■ Session III-2 : Payloads 1
## Wednesday, 22 October [16:30-17:30]

### [III-2-1] Discussion of Preliminary Design Review for MIRIS, the Main Payload of STSAT-3

Wonyong Han[1], Ho Jin[1], Jang-Hyun Park[1], Uk-Won Nam[1], In-Soo Yuk[1], Sungho Lee[1], Youngsik Park[1], Sung-Jun Park[1,2], Dae-Hee Lee[1], Chang H Ree[1], Woong-Seob Jeong[1], Bongkon Moon[1], Sang-Mok Cha[1], Seoung-Hyun Cho[1], Seung-Woo Rhee[3], Jong-Oh Park[3], Seung-Heon Lee[3], Hyung Mok Lee[4], and Toshio Matsumoto[4,5]

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KASI (Korea Astronomy and Space Science Institute) is developing a compact wide-field survey space telescope system, MIRIS (The Multi-purpose IR Imaging System) to be launched in 2010 as the main payload of the Korea Science and Technology Satellite 3. Through recent System Design Review (SDR) and Preliminary Design Review (PDR), most of the system design concept was reviewed and confirmed. The near IR imaging system adopted short F/2 optics for wide field low resolution observation at wavelength band 0.9~2.0 um minimizing the effect of attitude control system. The mechanical system is composed of a cover, baffle, optics, and detector system using a 256 x 256 Teledyne PICNIC FPA providing a 3.67 x 3.67 degree field of view with a pixel scale of 51.6 arcsec. We designed a support system to minimize heat transfer with Muti-Layer Insulation. The electronics of the MIRIS system is composed of 7 boards including DSP, control, SCIF. Particular attention is being paid to develop mission operation scenario for space observation to minimize IR background radiation from the Earth and Sun. The scientific purpose of MIRIS is to survey the Galactic plane in the emission line of Paα (1.88 μm) and to detect the cosmic infrared background (CIB) radiation. The CIB is being suspected to be originated from the first generation stars of the Universe and we will test this hypothesis by comparing the fluctuations in I (0.9~1.2 um) and H (1.2~2.0 um) bands to search the red shifted Lyman cutoff signature.

### [III-2-2] Tolerance Analysis of Compact Imaging Spectrometer (COMIS) for a microsatellite STSAT3

Eun-Sil Kim and Jun Ho Lee

*Kongju National University*

The STSAT-3 satellite was initiated in October 2006 and will be launched into a lower sun-synchronous earth orbit (~ 700km) in 2010. COMIS takes hyperspectral images of 30m/60m ground sampling distance over a 30km swath width. The payload will be used for environmental monitoring, such as in-land water quality monitoring of Paldang Lake located next to Seoul, the capital of South Korea. An extensive sensitivity and error budget analysis of COMIS optical system have been performed. As way of estimating aggregate effects of all tolerances, a Monte Carlo simulation is used.

### [III-2-3] Simultaneous imaging and radiometric performance simulation for computer generated GOCI optical system with measured characteristics

Soomin Jeong[1], Yukyeong Jeong[1], Dongok Ryu[1], Jinhee Yoo[1], Seonghui Kim[3], Seongick Cho[4], Sun-Jeong Ham[1,2], HeongSik Youn[3], Sun-Hee Woo[3], and Sug-Whan Kim[1]

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In this study, we report a new Monte Carlo ray tracing technique for estimating GOCI (Geostationary Ocean Color Instrument) radiative transfer characteristics and imaging performance simultaneously. First, a full scale GOCI optical model was constructed with measured characteristics at the component level and placed in the geostationary orbit. An optical model of approximated GOCI target area centered at the Korean penninsular was then built using the USGS coastal line data and representative land and sea surface reflectivity data. The light rays launched from a simulated sun model travel to the Earth surface, where they are reflected and scattered. Some of the light rays that are headed to the GOCI model in the orbit were selected and