

The simulation results show that the GOCl optical train delivers the correct level of radiative power capable of triggering the GOCl detector response in active measurement sequence. The details of IRT model and computational technique are presented together with the simulation results and their implications.

[PAY-04] In-orbit stray light performance for GOCl with realistic surface characteristics

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We report analysis results for GOCl stray light performance in orbital measurement sequence. First, we built a full 3D GOCl opto-mechanical subsystem model with the realistic data for their surface characteristics. This model was then incorporated into the in-house built Integrated Ray Tracing (IRT) algorithm that includes the sun, the measurement target and the GOCl opto-mechanical subsystem all combined in Monte Carlo ray tracing based radiative transfer computation. The IRT simulation was run for accurate evaluation of stray light level for several solar zenith angles representing the whole sequence of day time orbital measurement. The worst case source dependent stray light, taking place at sunset and sun rise, demonstrates that the GOCl opto-mechanical subsystem is well insulated from the harmful stray light level to the detector surface in active measurement operation. The simulation results and their implications are presented as well as the GOCl opto-mechanical model and the details of stray light computation.

[PAY-05] Test of a Compact Detector for the GeV and TeV Electrons in Space

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For the measurement of the high energy, GeV and TeV, electrons in space a stand-alone compact detector is described. The detector consists of a Synchrotron Radiation Detector (SRD) and a Transition Radiation Detector (TRD) as

a trigger device. The prototype trigger device was made of an irregular radiator and a thin scintillator crystal-photomultiplier detector instead of commonly used gaseous transition radiation detector. The proposed TRD has negligible impact on the SRD due to the backsplashes of high energy electrons as well as a low weight and moderate power consumption. The feasibility studies of the proposed TRD were done using GEANT4 Monte Carlo simulations and a prototype TRD test at CERN. For the trigger test the thin YAP scintillators of the various thicknesses, 60, 80, 100, and 140 micrometers were optically coupled to several HAMAMATSU R5900U photomultipliers and different layers of the irregular radiator in the thickness range from 0 to 40 cm were located in front of the TRD. The performance of the prototype trigger was studied in negative 5 GeV/c secondaries like negative pion, electron, and negative muon. During the trigger test the electrons are tagged by a Cherenkov counter. The MC simulation and the TRD test will be presented.

[PAY-06] MEMS space Telescope for the observation of Extreme Lightening (MTEL)

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A new type of telescope, a pinhole-like camera with a micromirror array, has been designed, fabricated and tested for space observation of extreme lightening called Transient Luminous Events (TLEs) occurring at upper atmosphere currently under question or investigation. The proposed telescope has the important functions: a wide field of view (FOV) surveillance, zoom-in on the object of interest, and tracking of fast-moving objects. The payload of the presented telescope will be carried into orbit by a Russian microsatellite Tatyana II rocket, of which the primary aim is to observe TLEs over a time period lasting at least one year. In this presentation, the novel MEMS obscura telescope for the observation of TLEs in the upper atmosphere is reported and a high fill factor, two-axis