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Title: EUV-OP – Extreme Ultra Violet Occultation Photometer & CSOL –Compact Solstice

Abstract:

The EUV-OP and CSOL are instruments that comprise the OWLS (Occultation Wave Limb Sounder) instrument that will measure the effects of gravity waves on the thermosphere. Specifically, CSOL will measure gravity wave potential energy in the lower thermosphere, while EUV-OP will measure the corresponding change in temperature of the middle and upper thermosphere. OWLS is under development to fly on the INSPIRESat3 microsatellite, being developed at Nanyang Technical University, Singapore.

This project focused on the electrical and optical development for OWLS. For the EUV-OP to function the circuitry must provide a steady 12 and negative 15 voltages. The electrical portion of this project was to test and find where these circuits are failing. The first circuit drives a diode temperature sensor which, through the voltage drop, the temperature is correlated. There is a 12V regulating circuit outputting a steady 12V. Since most instruments run on high voltages there is a step up circuit, inputting a small 5V and stepping it up to 15V. The last circuit is an inverting circuit, which inverts a positive 5V to a negative 15V. In general, to test the circuits a multimeter was used to measure the current and voltages to diagnose the circuit functionality. The CSOL telescope reflects the Sun's rays into the instrument to measure which gases are in the thermosphere. The optical portion of the project was to assure the telescoped reflected the rays correctly by creating a simulation to portray how it should function. Through the simulation, the precise location of the optical components, such as the slit and mirror inside the instrument was found. The simulation will also be used to diagnose the quality of the telescope as well as the precision of the image being reflected.