Contribution ID: **79** Type: **not specified**

The Ariel FGS' High Fidelity Simulator

Wednesday 11 March 2026 14:00 (1 hour)

Many space telescopes incorporate Fine Guidance Sensors (FGS) in their payload, which provide Line of Sight (LoS) measurements of the observed target to the spacecrafts Attitude and Orbit Control System (AOCS) for continuous correction. In many recent and upcoming Space Missions such as Ariel, these FGS's utilize MCT Infrared Detectors. In order to develop and tune the algorithms that will determine the target position as part of the Ariel FGS's Application Software (ASW), simulating the detectors Field of View becomes indispensable. While Ariel already has a very competent simulation suite for the MCT detectors with Exosim2, this suite is unfortunately not well suited for the later stages of FGS/AOCS testing and development, where the simulators are often integrated in large simulation benches. Here, resource consumption and execution time become critical and closed loop capability is needed, where the simulated Field of View is updated in real time by the spacecraft attitude reported by the AOCS. In order to fill this gap, we present our simulation suite that acts as a complement to Exosim2. The High Fidelity Simulator (HFS) is fed by stellar signals determined using Exosim and uses them in combination with a MCT detector model to provide faster than real time simulation of the FGS Focal plane with very little resource consumption on a single CPU core. This allows the HFS to be integrated in simulation environments used by the spacecraft supplier and the Electronic Ground Support Equipment of the FGS through the use of a Front End Electronics Emulator, allowing the ASW to control the simulator in the same fashion as the real detectors.

Author: MÖSENLECHNER, Gerald

Presenter: MÖSENLECHNER, Gerald

Session Classification: Poster Session