Les simulations Ariel par ExoSim

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In the context of the Critical Design Review (CDR) of the AIRS instruments, we carried out a series of flux simulations using the Exosim2 tool. Exosim2 is a time-domain simulator developed by Lorenzo Mugnai[1] for exoplanet transit spectroscopy observations that incorporates a detailed payload description of the Ariel spacecraft and its science instruments.

ExoSim generates an oversampled image of the focal plane populated with the astrophysical signal from the target source as well as foreground contributions. To simulate an Ariel observation, this focal plane is then used to produce sub-exposures, which are accumulated through non-destructive detector readouts.

The objective of these simulations was to estimate the electron flux captured by the instruments under various operational conditions. This was done by using the oversampled focal planes resampled to the native AIRS pixel resolution.

This work resulted in the publication of a technical note (ARIEL-IAP-INST-TN-002). In this presentation, we report on the key findings.

[1] : MUGNAI, Lorenzo V., BOCCHIERI, Andrea, PASCALE, Enzo, et al. ExoSim 2: the new exoplanet observation simulator applied to the Ariel space mission. Experimental Astronomy, 2025, vol. 59, no 1, p. 9.