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A dedicated high-energy particle environmental study for the Solar Orbiter coronagraph Metis

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High-energy particles penetrate spacecraft and to a different extent affect the performance of instruments flown on board space missions. Consequently, spacecraft carry particle detectors for both diagnostics and scientific purposes that allow to monitor the galactic cosmic-ray and solar energetic particle fluxes during the whole mission elapsed time. These data allow us to disentangle long and short-term variations of the GCR flux associated with the solar activity, the passage of interplanetary counterparts of coronal mass ejections and high speed solar wind streams. Monte Carlo simulations of the GCR tracks observed in the Metis coronagraph visible light images have shown that the background of spurious pixels fired by cosmic rays is only a fraction of the order of 10^{-4} of the whole pixel sample and therefore they do not affect sensibly the quality of the Metis images. Moreover, the comparison of the simulations with the cosmic-ray matrices obtained from the Metis VL light images mainly consisting of primary and secondary particles generated by primary protons indicate that Metis may play the role of a detector to study the variations of GCRs and SEPs during the next decade.

Student poster?

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