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WINK: Advancing X and Gamma Ray Detection Technology for Space Observations

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WINK is a proof of concept prototype designed to test, enhance and approve the base technology of Crystal Eye. While Crystal Eye is intended for all-sky monitoring of X and gamma rays in the 0.1–30 MeV range, whose primary objectives include investigating the prompt emissions of Gamma Ray Bursts (GRBs) - and acting as pointing system for other detectors in order to study the associated afterglow - and studying EM signals associated with extreme cosmic phenomena, WINK will contribute to the characterization of the cosmic background and, when directed toward Earth, will allow the study of atmospheric phenomena such as Terrestrial Gamma-Ray Flashes (TGFs).

The WINK system consists of three full pixels of the original concept of Crystal Eye: each pixel is composed of two layers of LYSO crystal, each read by Silicon Photomultipliers (SiPMs), and an anti-coincidence system. The final instrument will feature 112 pixels arranged on a hemispherical surface with a 14 cm radius, providing a wide field of view (FoV) and high localization accuracy.

WINK is scheduled to operate for two months in low Earth orbit (LEO) aboard Space Rider (SR), an ESA vehicle. Positioned within the module, it will have a 30° FoV, enabling crucial field tests to refine the final detector's design. The WINK qualification model has been developed and built, featuring a space-qualified electronic board and updated software, and will enable further testing to enhance performance and reliability. In this contribution, we present the initial test results along with progress on the qualification model.

Collaboration(s)

Crystal Eye

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