

SENTINEL-2 NG SWIR DETECTOR

Alexandre Gaucher^{1*}, Sauveur Tirano¹, Simon Allamel¹, Jérémie Fouque¹, Paraskevi Ntova¹, Laurent Baud¹, Diane Sam-giao¹, Thibaut Courrenq¹, Quentin Chable¹

¹LYNRED, Actipole - CS 10021, 364 route de Valence, 38113 Veurey-Voroize, France

*alexandre.gaucher@lynred.com

Forty years of heritage have shaped Lynred into a leading provider of advanced infrared detectors for defense, space, and civilian applications. As a global leader, Lynred delivers high-quality II-VI, III-V, and bolometer-based infrared detectors from near to very far infrared. In addition, space radiation robustness of MCT technology combined with space hardened detectors architecture enables LYNRED to be the leading European manufacturer for IR detectors deployed in space. To date, more than 80 flight models incorporating these detectors have been successfully launched into space.

Several Copernicus missions are currently based on LYNRED SWIR detectors and are delivering state-of-the-art data on a daily basis, such as Sentinel-2 and Sentinel-5. Copernicus Expansion missions being developed will also benefit from LYNRED SWIR technology for the LSTM VNIR-SWIR and CO2M SWIR detectors. LYNRED benefits from the largest heritage (space proven) in infrared detection in the SWIR domain in Europe.

ESA is now preparing the Copernicus NG missions. The challenge of the Sentinel-2 NG mission is to ensure continuity with the current Sentinel-2 mission while enhancing observing capabilities. Improvement of the spatial sampling distance as well as addition of new spectral bands is requested, which is directly linked to the detector design. LYNRED has been selected by ESA in 2023 for the pre-development of the Sentinel-2 NG SWIR detector. The objective of the detector pre-development phase is to demonstrate a TRL5, by the end of 2026, for a detector specifically designed for the mission. In that purpose, ESA, LYNRED, ADS and OHB (the two selected S2 NG AB1 instrument primes) have been working together to propose the best detector design, adapted to both instruments, and fully fitting the mission goals. This paper presents the Sentinel-2 NG SWIR detector design and verified performances, including signal to noise ratio, non-linearity and operability.