

Screening and Pre-evaluation of Shortwave Infrared Laser Diode for space application – Objectives

Since a number of years Distributed-Feedback (DFB) semiconductor laser diodes capable to be tuned to any frequency in the Short Wave Infrared (SWIR) domain, with wavelengths up to ~2.8 micron, are available. They have been used on-ground in telecommunications and can be regarded as the optical equivalent of the voltage control oscillators (VCO) in electronics: the emitted wavelength depends only on well-controlled parameters in a robust and reproducible way. Fast tuning is possible by e.g. current control and large mode-hop-free tuning ranges are achievable. Applications of these laser diodes in space include remote sensing by active limb sounding. Very good frequency and intensity stability performance is required for this and other applications, at output powers in the order of tens of mW in continuous wave (CW) operation. There is no experience with such diodes in space and the capability to maintain the ground-proven performance in the space environment is being questioned. This activity will select and pre-evaluate the most promising SWIR laser diodes with respect to the relevant optical, electrical, mechanical, and reliability parameters, deriving specific conclusions for the envisaged qualification program.

This contract will concern itself with a pre-evaluation exercise leading to a further qualification requirement and recommendation at a later stage. The final qualified SWIR diode is intended to be used for ACCURATE technology demonstrator.