

ZiNIR Ltd; Novel Ultra-miniature Sensing Technology for Space

Project Summary

Solo Spectroscopy is an innovative solid-state spectrometer concept in which wavelength dispersion and detection are integrated in a single monolithic semiconductor chip. The chip is based on a series of microdisk resonators arrayed along a central waveguide. Each resonator acts as a wavelength-selective photodiode; when broadband light travels down the waveguide, each resonator picks out a different wavelength and generates a photocurrent. The combined signals from the resonators create an electronic read-out of the spectrum.

This design overcomes issues of stray light, physical fragility, optical alignment and reduced spectral resolution with miniaturisation that affect conventional spectrometers. The Solo chip also offers extremely small mass and footprint, is maintenance-free, temperature stable, has low power consumption and can be produced in high volumes at low cost, making it ideal for space-based spectroscopy.

The aim of this project is to conduct a market survey for Solo Spectroscopy in the space sector, and to develop technical specifications for a selection of identified applications. We will engage with potential end-users and prioritise applications in terms of technical feasibility, disruption to the status quo and importance to the UK space technology sector, and put forward a proposal for further funding to develop the most promising application.

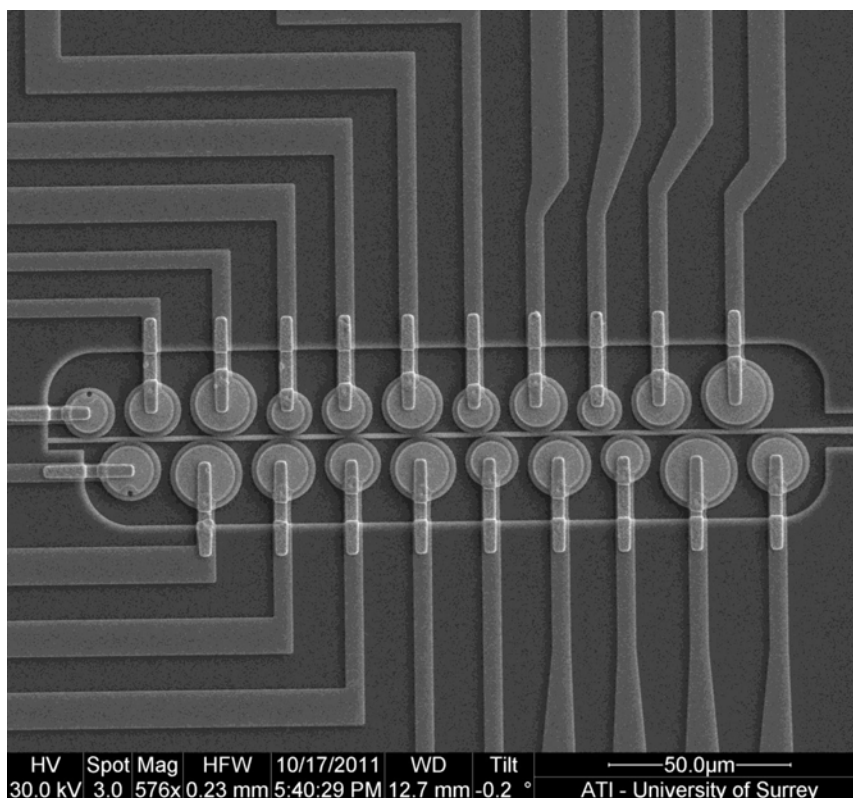


Figure 1: Scanning Electron Micrograph (SEM) image of prototype Solo Spectroscopy chip