

The detector for shortwave hyperspectral imaging EnMAP

D. Hübner¹), A. Bauer, H. Bitterlich, M. Bruder, M. Haiml, K. Hofmann, K.-M. Mahlein, H.-P. Nothaft, R. Wollrab, L.D. Haas, J. Ziegler

AIM INFRAROT-MODULE GmbH, Theresienstr. 2, D-74072 Heilbronn

Abstract for Review Process (269 words)

EnMAP (**En**vironmental **M**apping and **A**nalysis **P**rogram) is German Hyperspectral Satellite Mission. The goal of the mission is the determination of ecosystem parameters as well as biophysical, biochemical and geochemical variables. Additionally the capability to Analysis post natural disasters and environmental pollution of land and water. Within 200 spectral channel the broad spectral range from 420 nm to 2450 nm will be covered. The AIM detector will cover the wavelength range from 0.9 μ m to 2.45 μ m.

The cryogenically cooled Hg_{1-x}Cd_xTe (MCT) detector array is well suited to cope the needs of this mission. High quantum efficiency, low dark current and linearity are key parameters of the detector leading to a successful mission of the system, having the desired data sets in mind. Taking advantage of the spectral fingerprints in the SWIR range detailed information can be drawn from the measured data.

The 1024x256 detector has a 24x32 μ m pixel pitch which leads to an optical active area of 24.6x8.2 mm². The silicon ROIC (readout integrated circuit) is optimized for measurement of low photon fluxes with frame rates of up to 250 fps for the full 1024x256 array with 14 bit video resolution. Due to the nature of spectral data each of the 256 spectral lines can be set individually into a low or high gain mode or turned off on-chip for reduction of the data volume for irrelevant spectral lines. For smaller sub-frames the frame rate can be increased to several 10.000 fps which makes the detector capable to monitor fast processes.

Within this talk the newest results regarding electro optical performance of the EnMAP SWIR detector will be presented.

Abstract for Publication (100 words)

In this paper, the latest results of the 1025x256 short wavelength infrared HgCdTe (MCT) (SWIR 0.9-2.5 μ m) detector will be presented, which is dedicated for the temperature range between 120 and 200 K cold tip temperature. The silicon ROIC (readout integrated circuit) is optimized for measurement of low photon fluxes with frame rates of up to 250 fps, with 14 bit video resolution. Due to the nature of spectral data each of the 256 spectral lines can be set individually into a low or high gain mode or turned off on-chip for reduction of the data volume for irrelevant spectral lines.

keywords: HgCdTe, MCT, SWIR, dark current, EnMAP

¹ Corresponding author: dominique.huebner@aim-ir.com Phone: +49-7131-6212-185, Fax: +49-7131-6212-199