Workshop 2024
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ABSTRACT PRESENTATION

Title: Recent Uncooled Infrared Sensor Developments
Presenter name: Sander Gierkink
Company name / Institute: Teledyne Dalsa
Project name:
Funding group: None
Abstract can be published on website: ☒ **YES** ☐ **NO**

Provide abstract of 500 words maximum. Use font ARIAL, size 11.
If figures are used, the text plus figures must stay within this one page.

Long Wave Infrared (LWIR) sensors are sensitive in the spectral range of 8-14 µm, where infrared power peaks for body temperatures in the range of -40ºC to +100ºC.

A typical uncooled LWIR sensor includes a MEMS fabricated, vacuum sealed micro-bolometer pixel array built on top of a CMOS Read Out IC (ROIC).

Some of the challenges in LWIR pixel manufacturing are for example good infrared absorption, low pixel thermal conductivity to silicon substrate, low pixel thermal time constant and good quality pixel vacuum seal.

Teledyne Dalsa's LWIR sensors include pixel biasing, configurable AD converters and serial digital data outputs. The sensors achieve an NETD < 50mK with a scene dynamic range higher than 1000°C without any adjustment of sensor settings. This is achieved with a high-dynamic range AD converter design, combining low equivalent input noise with large input signal range.

At the camera level, image processing algorithms are used to further reduce temporal and fixed pattern noise. One of the challenges here is to suppress potential image artifacts due to drift. Uncooled LWIR cameras typically use a mechanical shutter to combat effects of sensor substrate temperature drift. The ultimate challenge is to create a "shutterless" uncooled LWIR camera.