

Preliminary Results from the Submarine Gamma Imager

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The Submarine Gamma Imager

Goal

Develop a novel submarine gamma radiation imager

Motivation

Detection, localization and identification of radioactivity in underwater environments

Platform

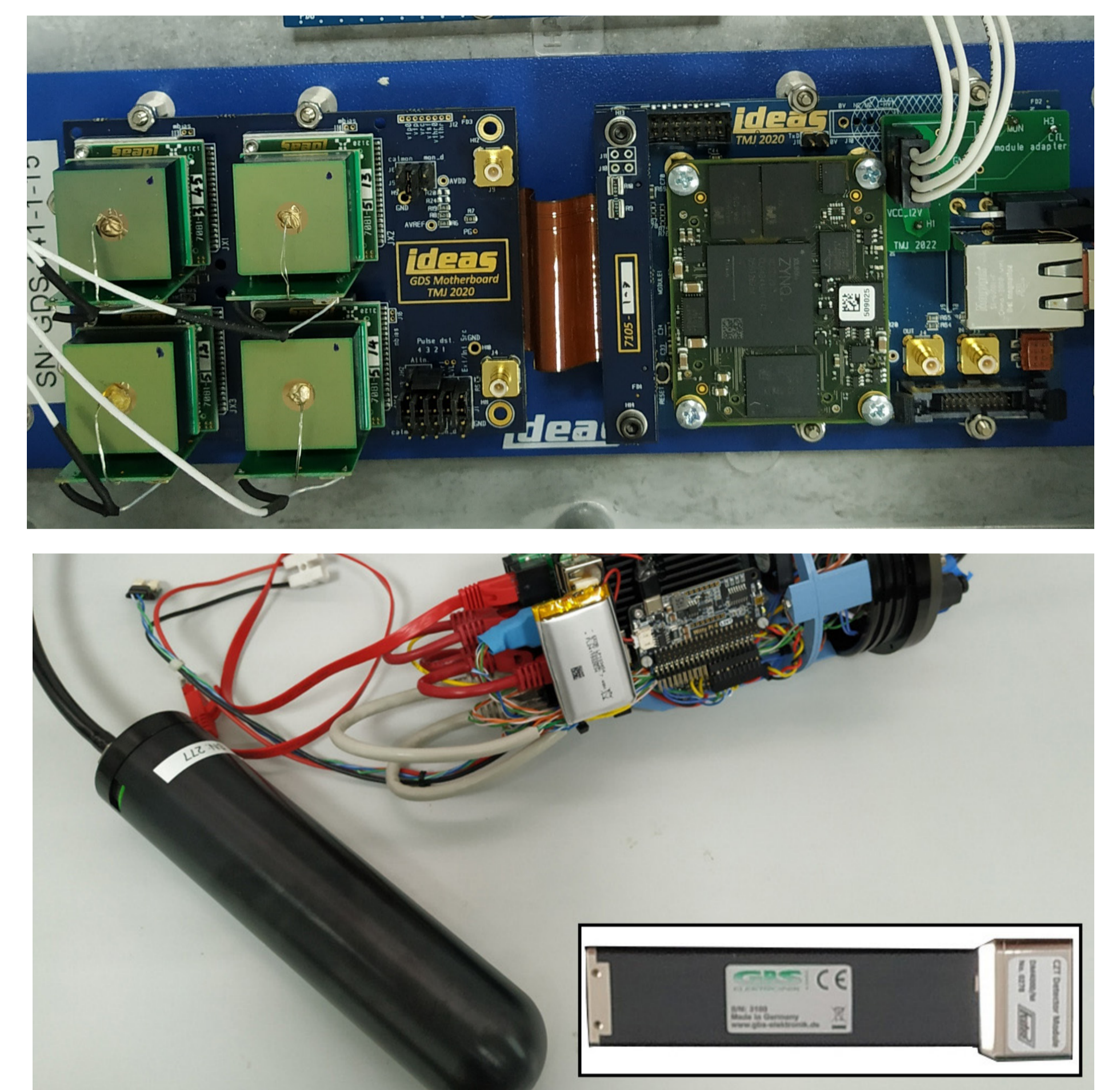
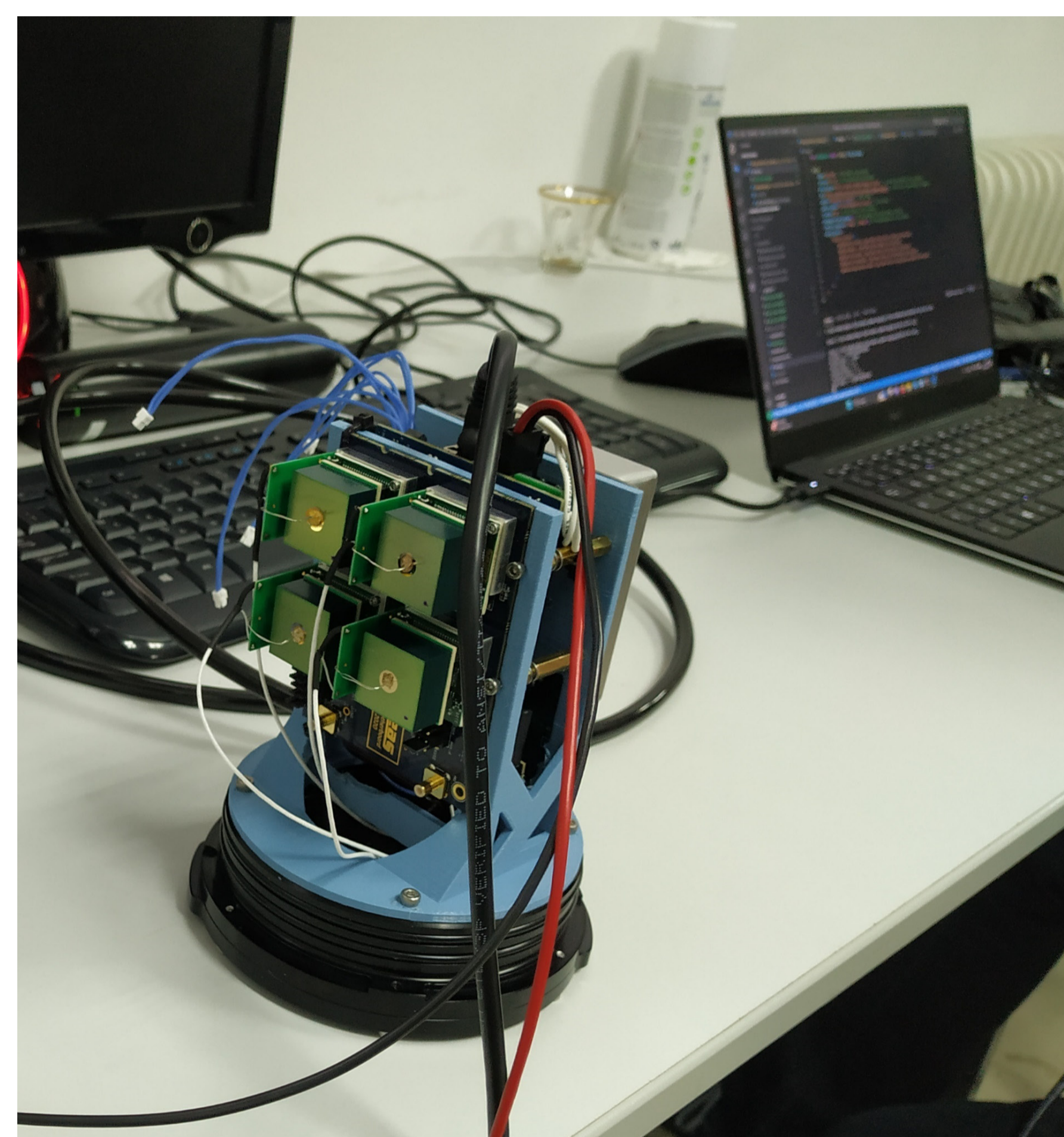
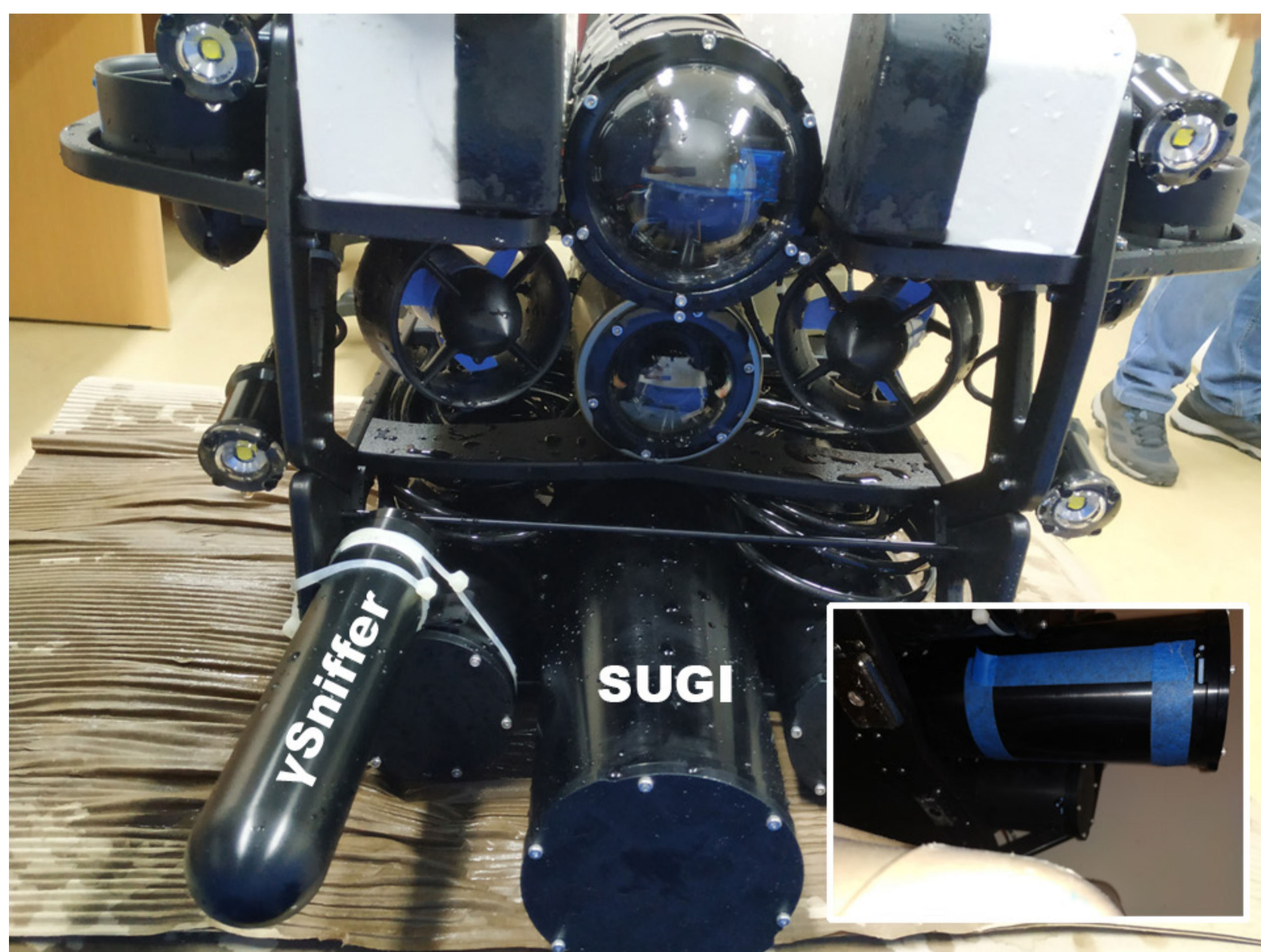
Static benthic laboratory or remotely operated vehicle

Hardware

- Based on GDS-100 with four GDS-10 ASIC modules by IDEAS AS
 - Each 11×11 pixelated module is paired with a CdZnTe crystal

Validation protocol

- Comparison of counts and spectrum (up to scale) with a fully characterized gamma detector based on Ritec μ SPEC 4000



Experiments at Milos Hydrothermal Fields

Location

Hydrothermal fields at the island of Milos, Greece

1. Palaiochori beach [1]
2. Alykes

Experiments

- Measure radioactivity in the water column and on the seabed
- Measure radioactivity at hydrothermal vents (degassing/discolorations)

Findings

- High radioactivity levels close to the vents on the seabed
- Reduced levels in the water column
- Detected isotopes of the Pb-214 and Bi-214 chains
- Perfect agreement with reference gamma detector
- Next step: Compton imaging

[1] Puzenat et al., Marine Geology 438 (2021): 106521

