



## **A new compact, cost-efficient concept for underwater range-gated imaging: the UTOFIA project**

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*Publication date:*  
2015

*Document Version*  
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

*Citation (APA):*

Quincoces, I., Galparsoro, I., Bald, J., Gabina, G., Visser, A., Mariani, P., & Jonasdottir, S. (2015). A new compact, cost-efficient concept for underwater range-gated imaging: the UTOFIA project. Poster session presented at ICES Annual Science Conference 2015, Copenhagen, Denmark.

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# A new compact, cost-efficient concept for underwater range-gated imaging:



the **UTOFIA** project

<http://www.utofia.eu>

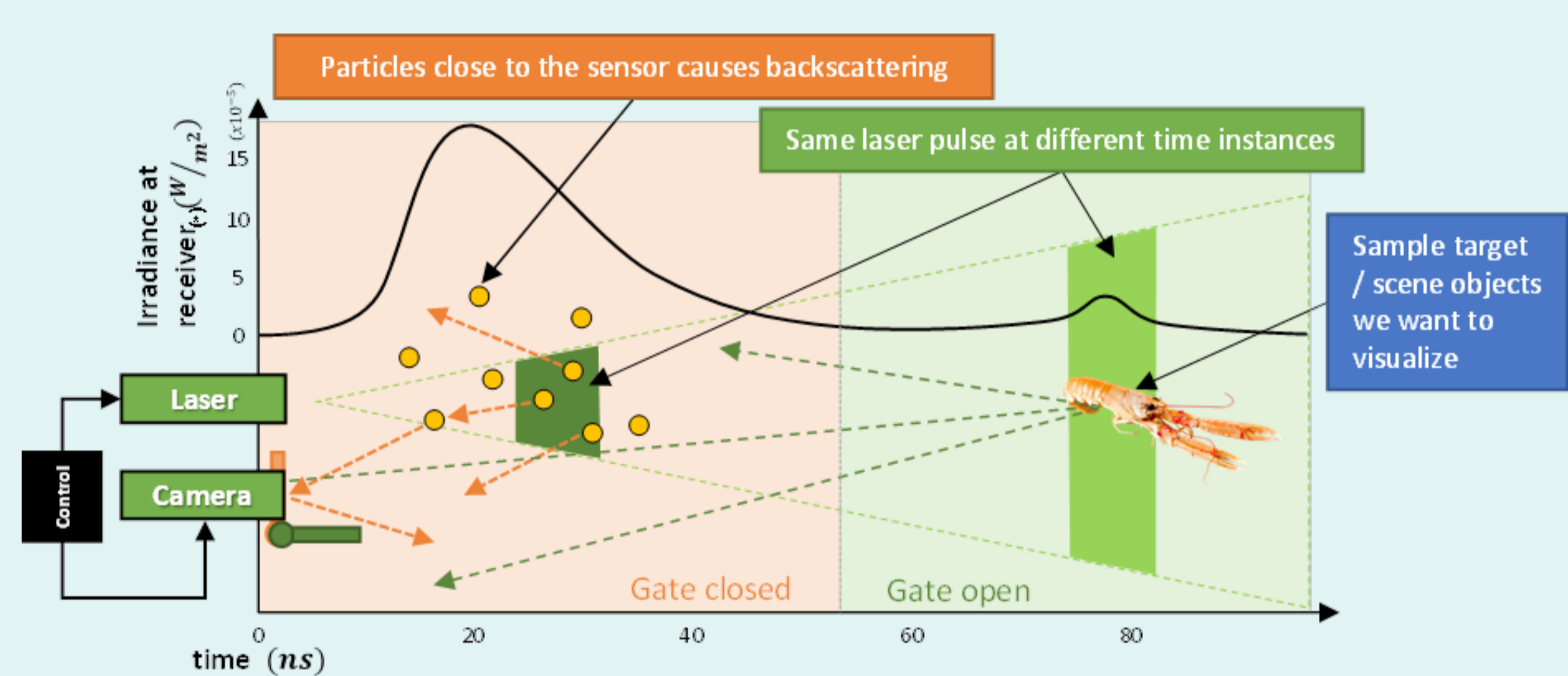
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ICES CM 2015/C15

## 2014 The Concept

UTOFIA will develop a compact and cost-effective underwater imaging system for turbid environments. By using range-gated imaging, the system will extend the imaging range by factor 2 to 3 over conventional video systems. At the same time, the system will provide video-rate 3D information. This will fill the current gap between short-range, high-resolution conventional video and long-range low-resolution sonar systems.



2015

## Zero prototype Results

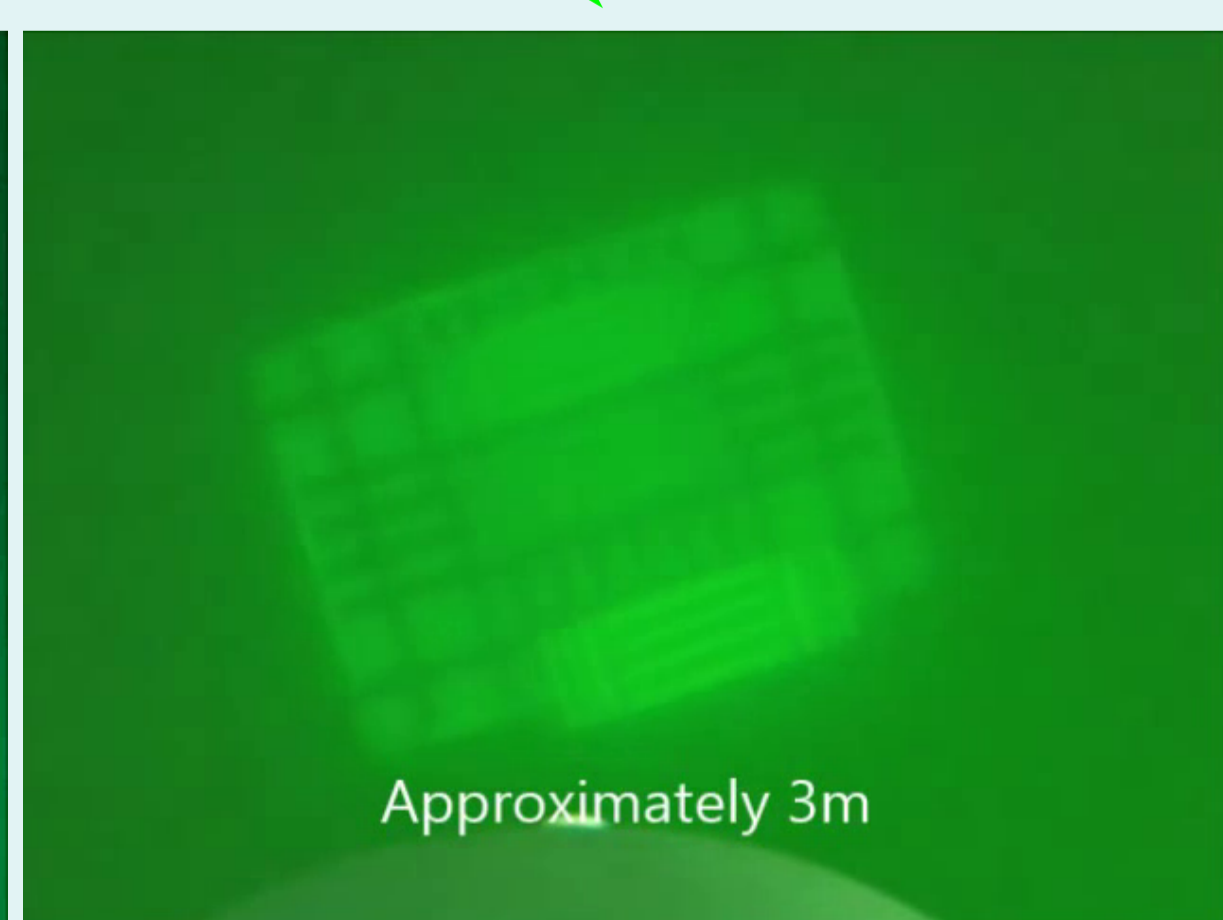
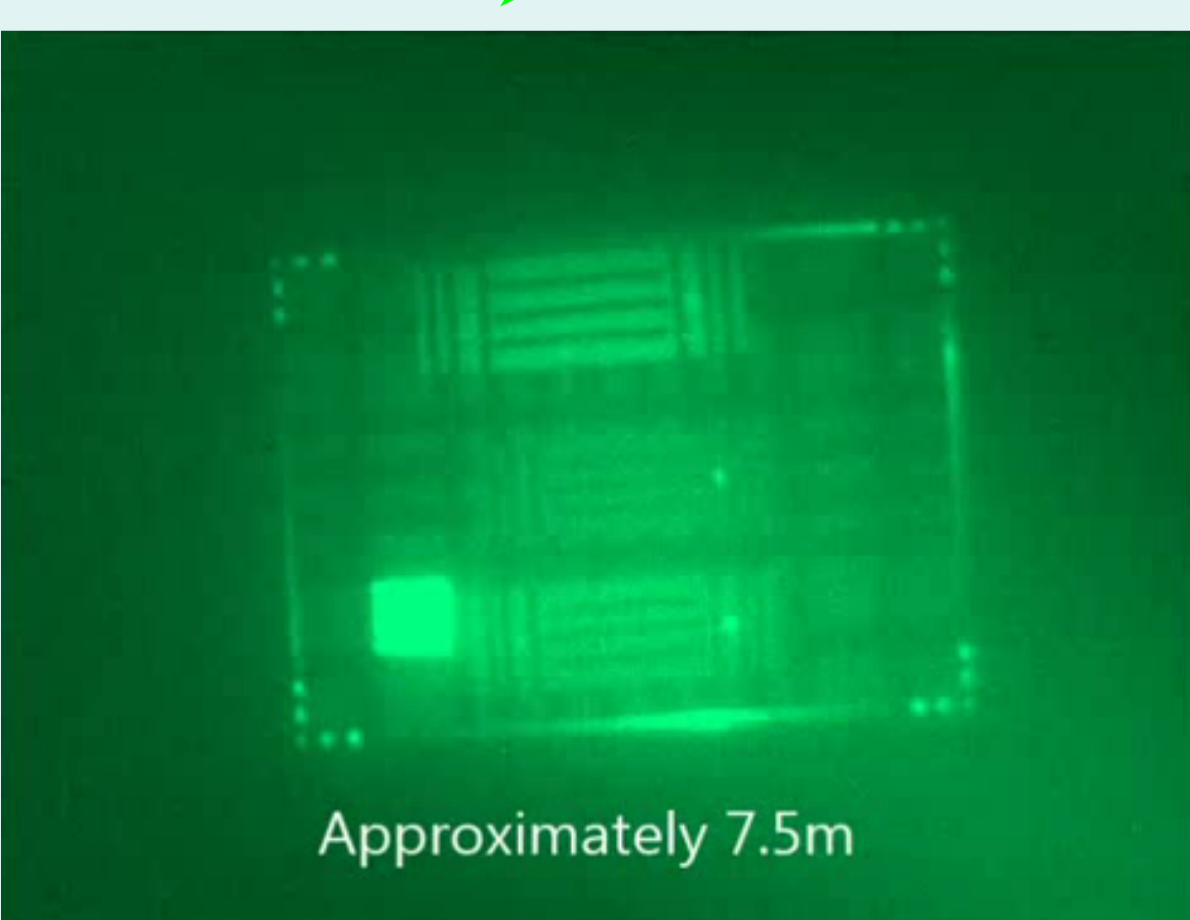
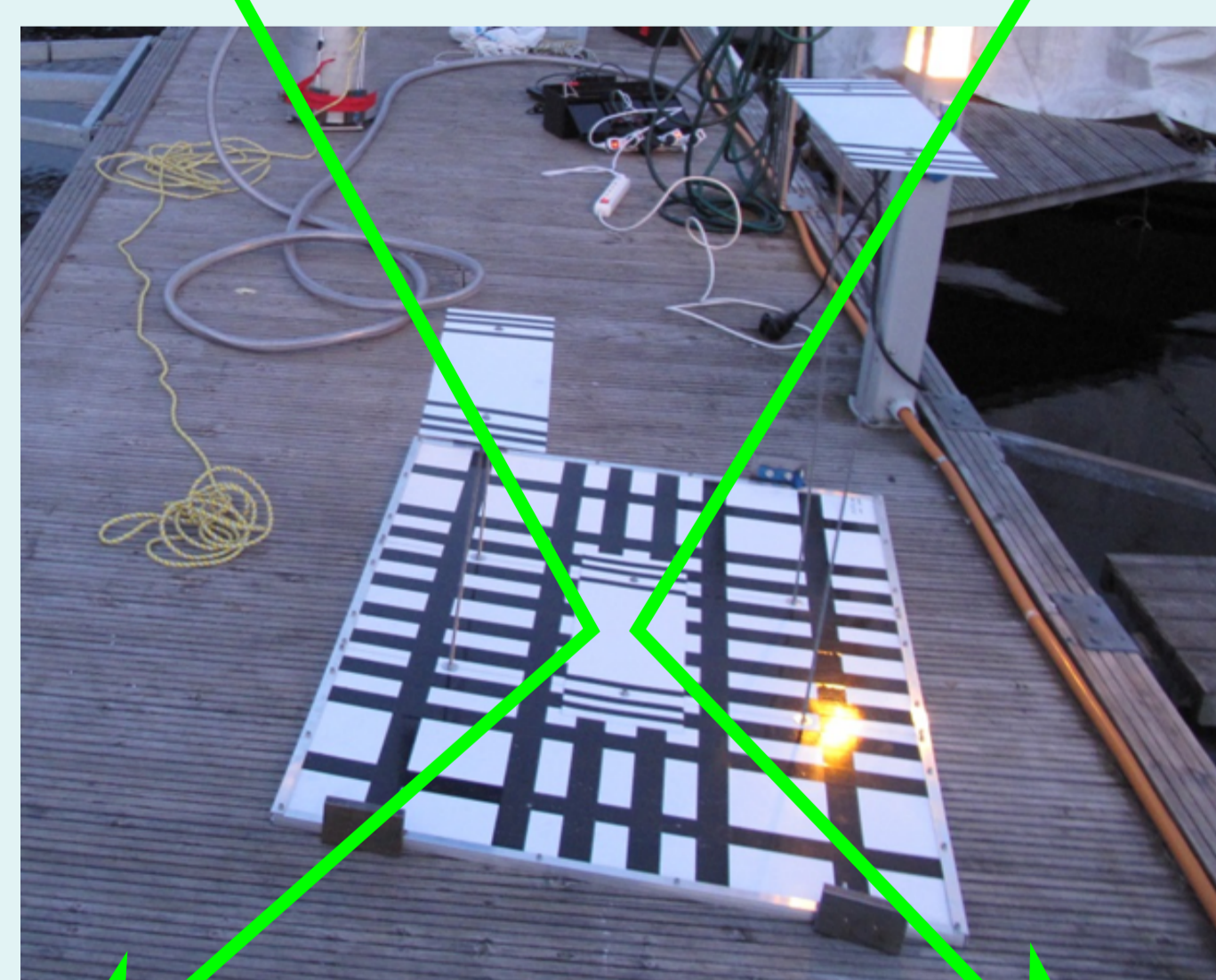


VS

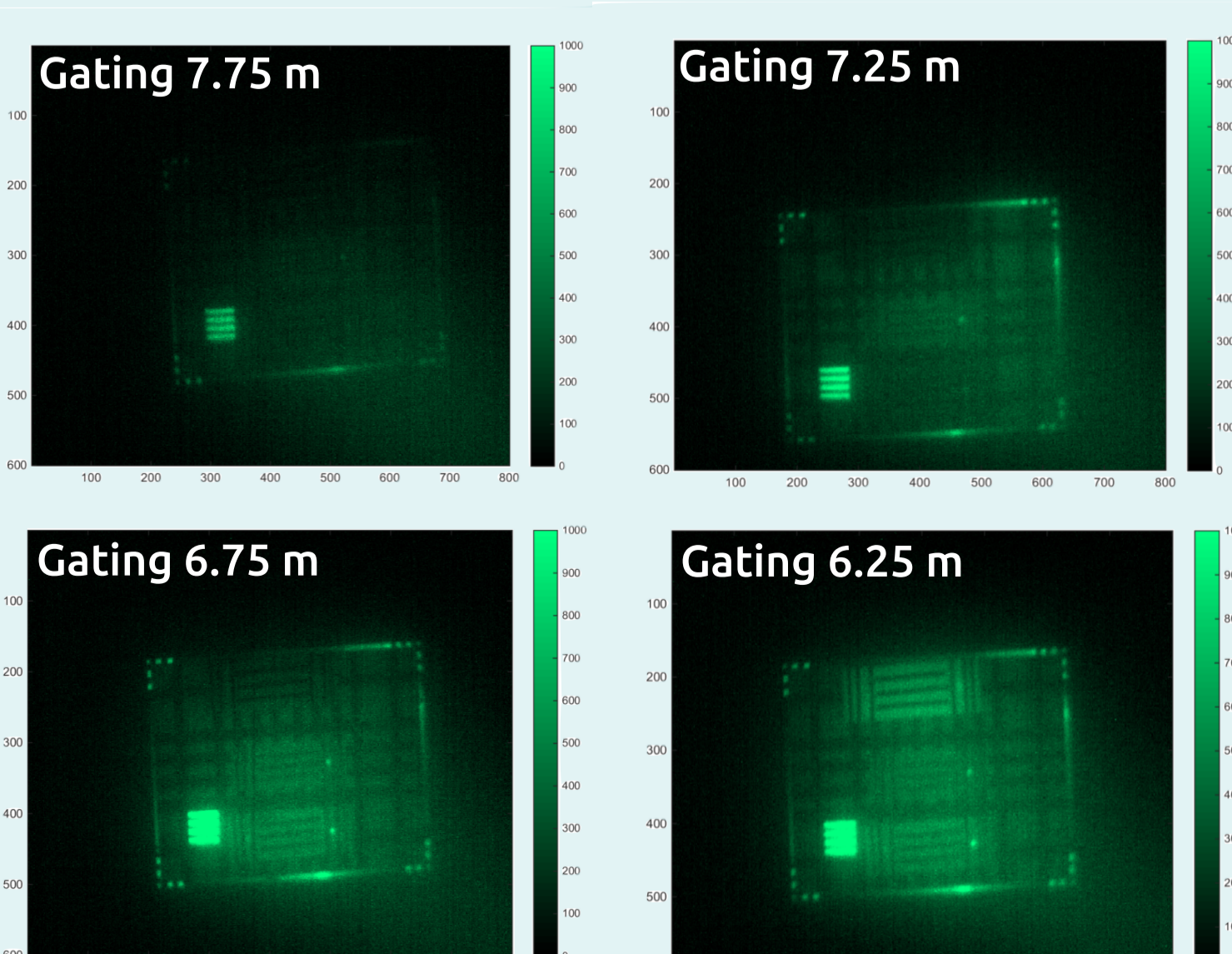


The Aspirant UTOFIA zero

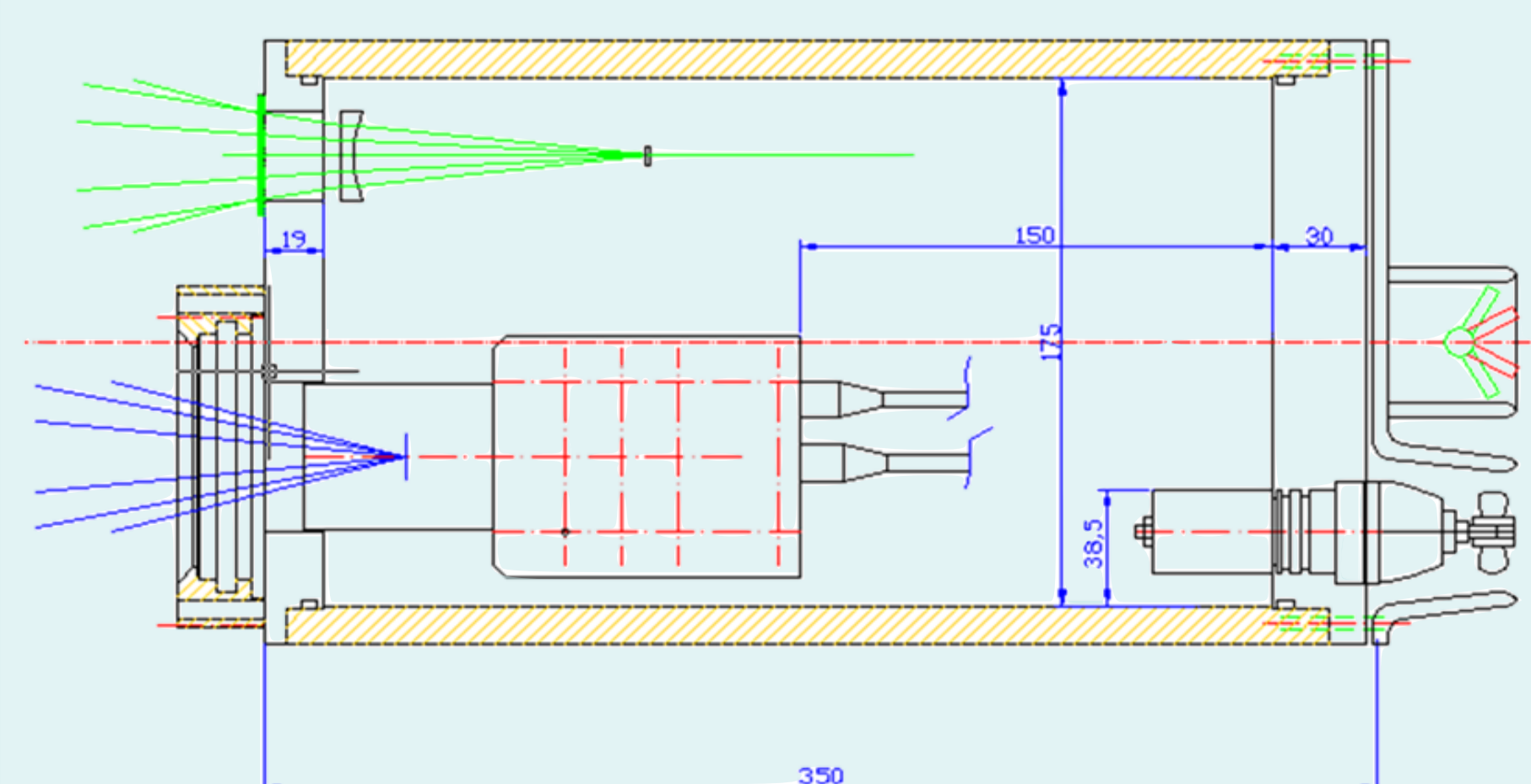
The low cost champion GoPro 4



Back scatter reduction --> 2.5 x longer range



End-user feedback



3D ABILITY --> the distances to and the size of an object is known.

## 2017 Final testing



\* Benthic habitat and population mapping:  
- compared with traditional sensors used for the assessment of Nephrops or sea urchin or to study seafloor habitats integrity

\* Marine litter survey:  
- performance assessed compared to existing technologies in variable visibility conditions (Marseille harbour)

\* Pelagic fish school size and species identification  
- explore the feasibility of 3D imaging for pre-screening fish schools for fisheries applications or for species and size identification in acoustic surveys (North Sea and Bay of Biscay)

2017

Final prototype Target Specifications  
*To be defined but smaller and more close to final product*

2016

Prototype one Target Specifications

DESIGN PARAMETER	Description
Size	200 mm outer diameter and 350 mm long
Weight	11 kg maximum
Housing material	Aluminum flanges in front and back connected with a POM tube
Cooling	Active cooling of back flange by a thruster motor with a propeller
Laser volume	4.1ltr (4,6ltr)
Volume beam optics	Ø50 x 120mm
Power	24-30 V, 4A laser, 1A camera
Connector	13pin wet mateable hybrid GigE+power in the back flange
Wiring	8pin Ethernet, 2 pin 28Volt, 1pin ground/shield, 2 pin RS485
Cable	hybrid GigE, power and signal, length 80 m (TBD) 50-100m
Camera	Form fit and function as for System 0. Two more outputs are available for the odos camera. FRG camera will be mounted on a bracket compatible with the odos camera.
Camera lens	Fixed focus camera lens f/# < 1 Remote operated focus for camera lens
Field of view	3,5 x 3 m at 5m distance
Field of illumination	Ø 2-2,5m at 5 m distance. (depending on diffusor)
Laser	Pulse energy: 2mJ at 1kHz Eye safety classification: 3B