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UNIVERSAL AUTONOMY

Reliable Radar Localisation and Perception for Marine Autonomy

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At Oxbotica, we're on a mission to make the Earth move.

We are the global leader in autonomous vehicle software for businesses.

Founder and CTO - Prof. Paul Newman - Author of MOOS

Oxbotica is fuelling **Universal Autonomy**: the ability of any vehicle, of any size, in any place to operate autonomously, safely and sustainably.

Terran-360 Radar Product

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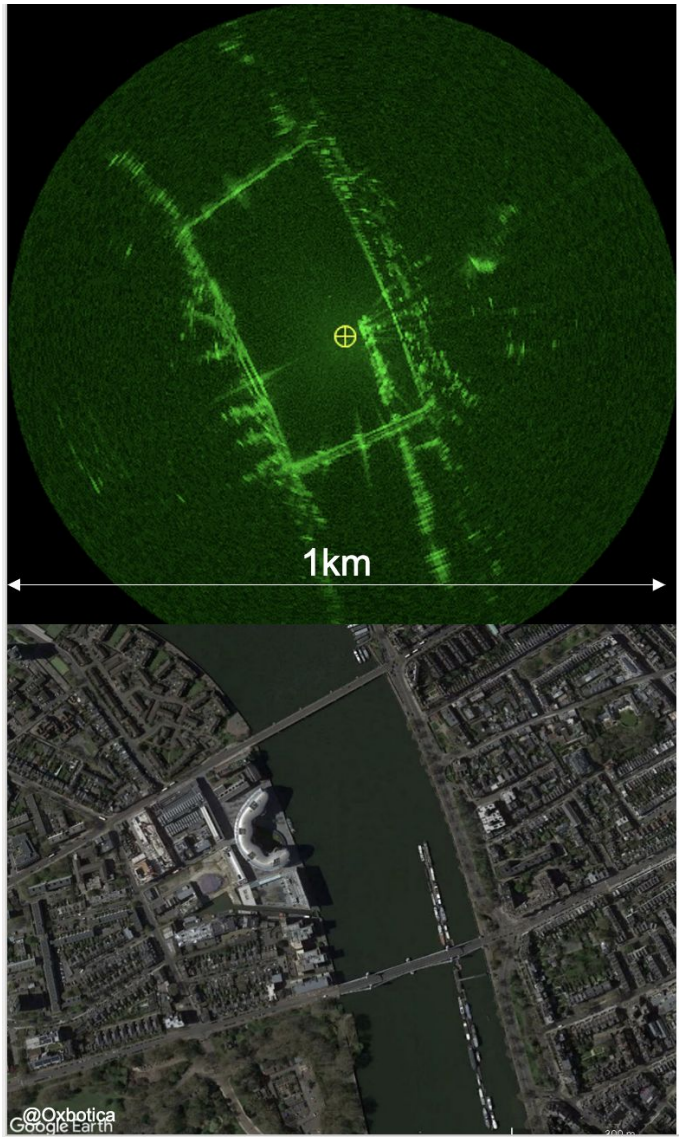

Single Sensor, Radar-only Localisation Solution

Key Features

- Radar only odometry and localisation solution
- Single sensor solution: 360°, long-range radar
- GNSS and Infrastructure free
- Centimeter level accuracy in any environment
- Proven reliability in the harshest conditions
- Robust and highly efficient algorithms

Positioning that works in all conditions and everywhere

NAVTECH RADAR

Why Terran360 ?

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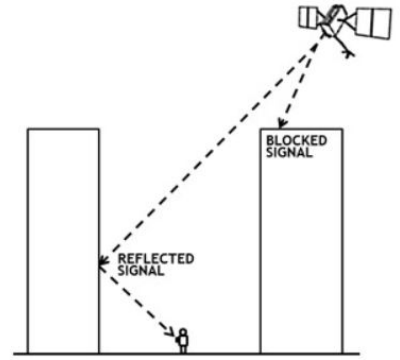
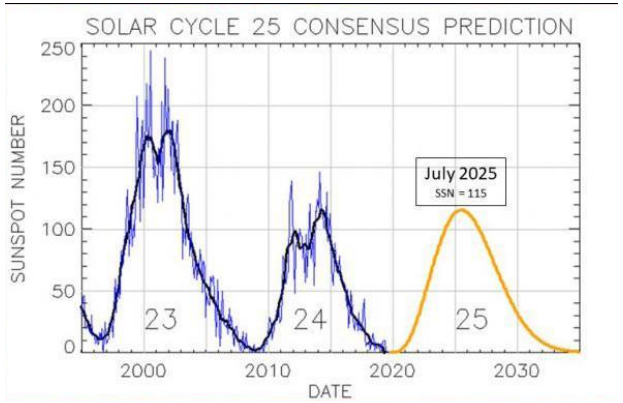
Reliable localisation that's infrastructure free

- Localization is a critical capability for autonomous vehicles.
- Current technology cannot provide the availability required for mission critical environments.
- GPS dependant implementations have severe limitations and are unreliable in certain conditions - this is only getting worse.
- Laser and vision based sensors fail in adverse weather or dust and cannot be relied upon.
- Many autonomous pilots are not at the point where ultra high availability is required.
- Ultra high availability is required if end users are expected to get real world benefits.



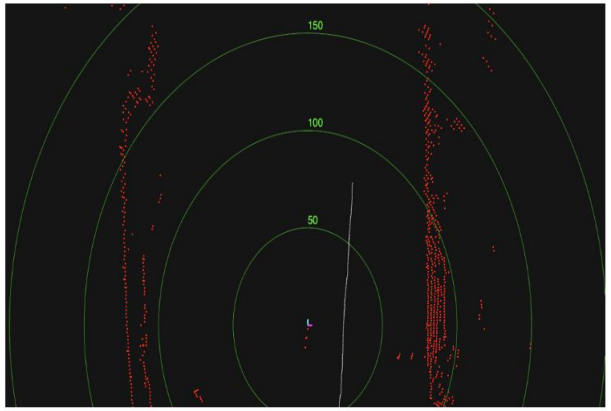


NAVTECH RADAR

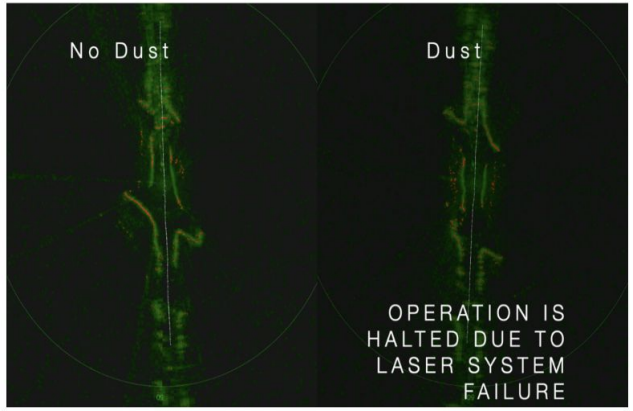
Terran-360 Radar Product

Key product characteristics

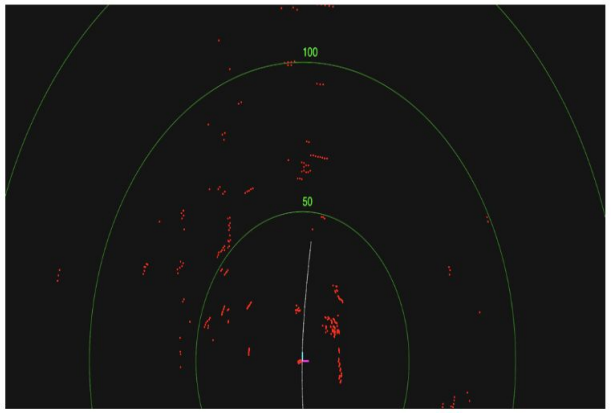
Environments with Few Features – River



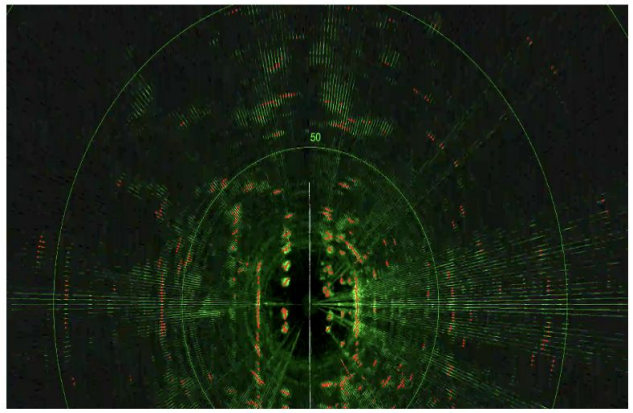
Dusty Enclosed Environments – Mining



Hybrid Environments – Rail



Environments with Dynamic Objects – Urban



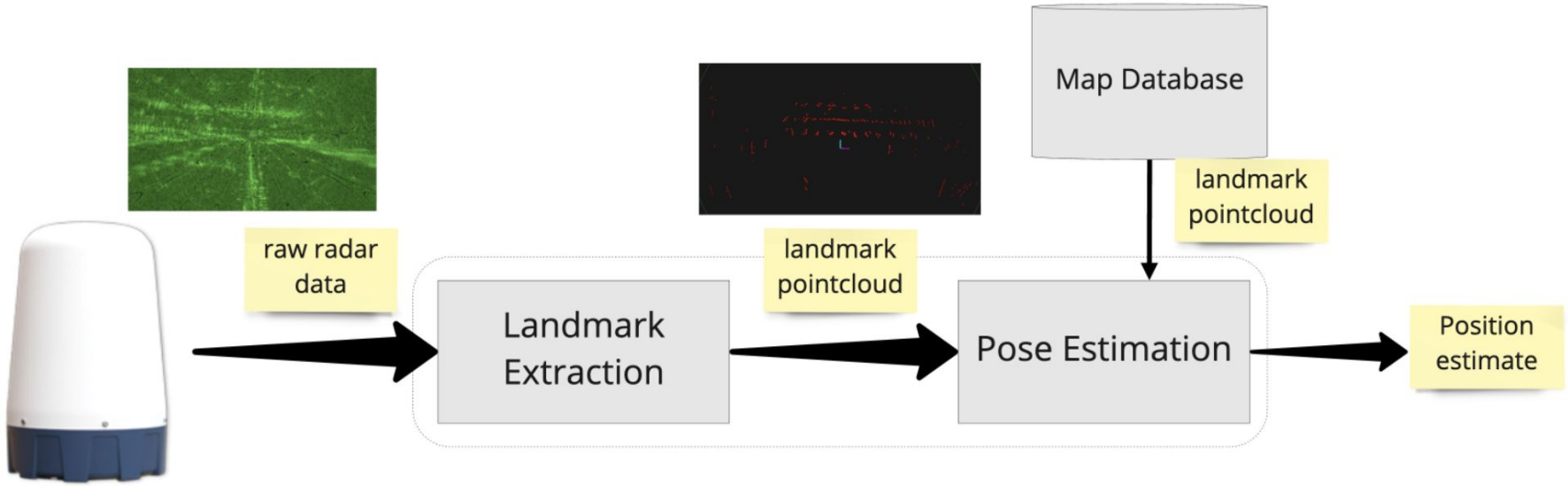
- It can be deployed globally in all environments, as long as there is enough semi-permanent structure visible to the radar sensor
- It will work in virtually all weather and environmental conditions, including dust, smoke, fire, fog and torrential rain
- It is infrastructure-free (it requires extra work to mount, integrate and operate due to the need for a pre-existing map).

Radar Odometry and Localisation

Ego-motion estimates

Localisation & Mapping

Place recognition module - No seed, large offsets and orientation invariant.



Terran360 on the Thames

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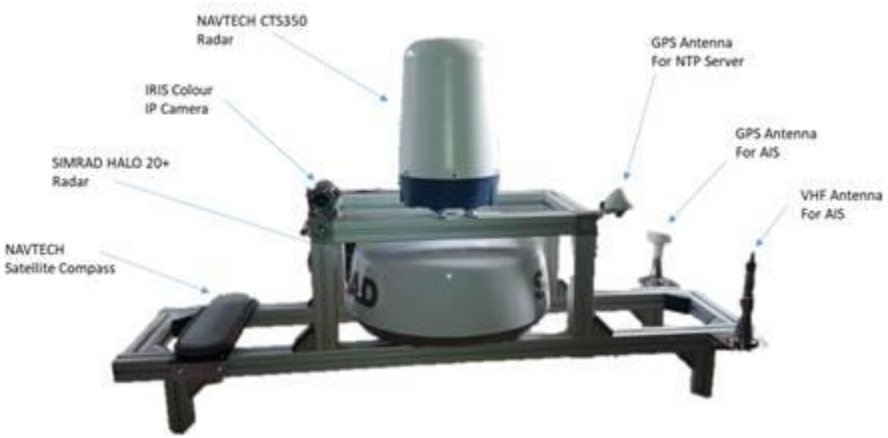

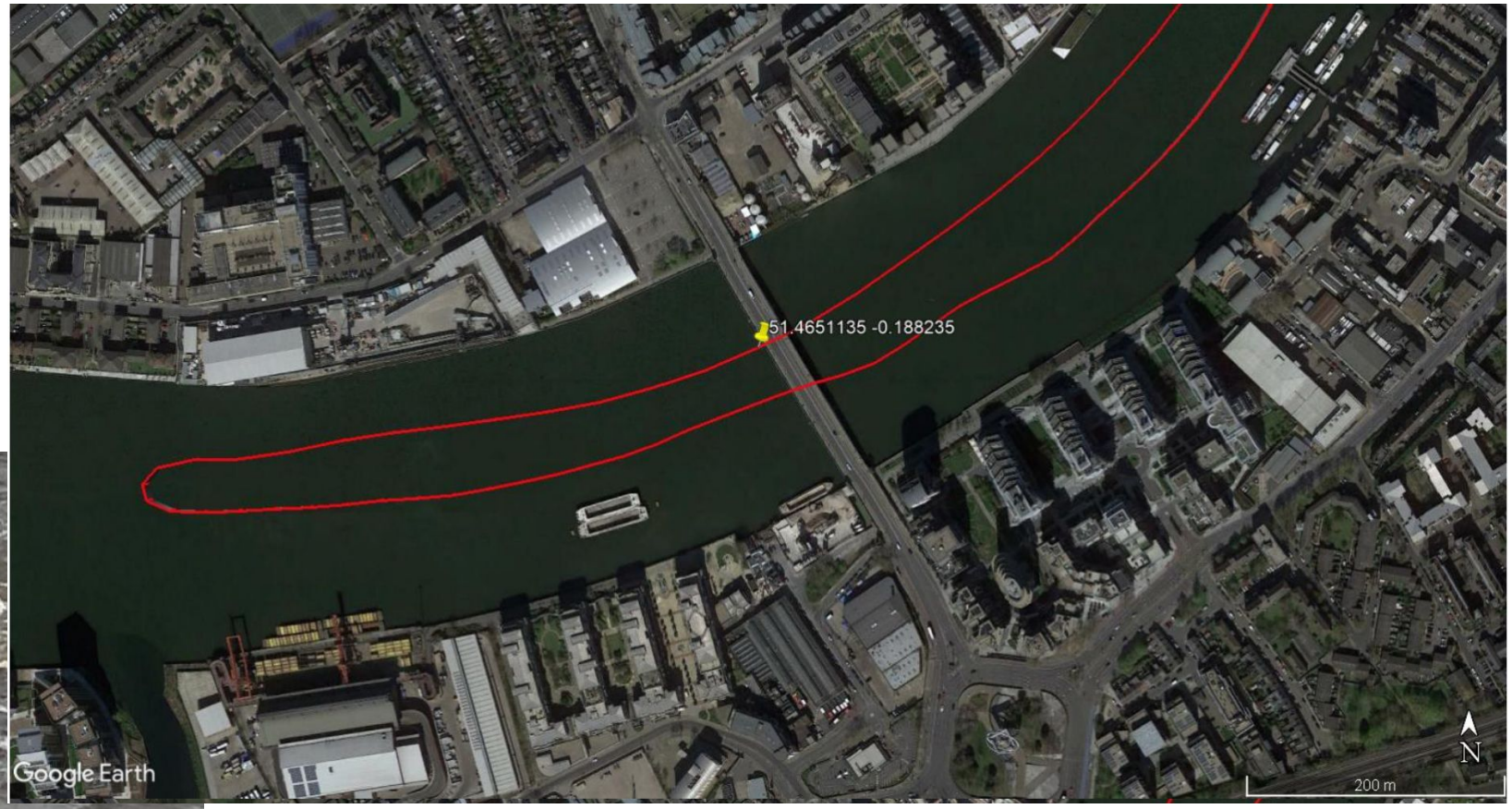

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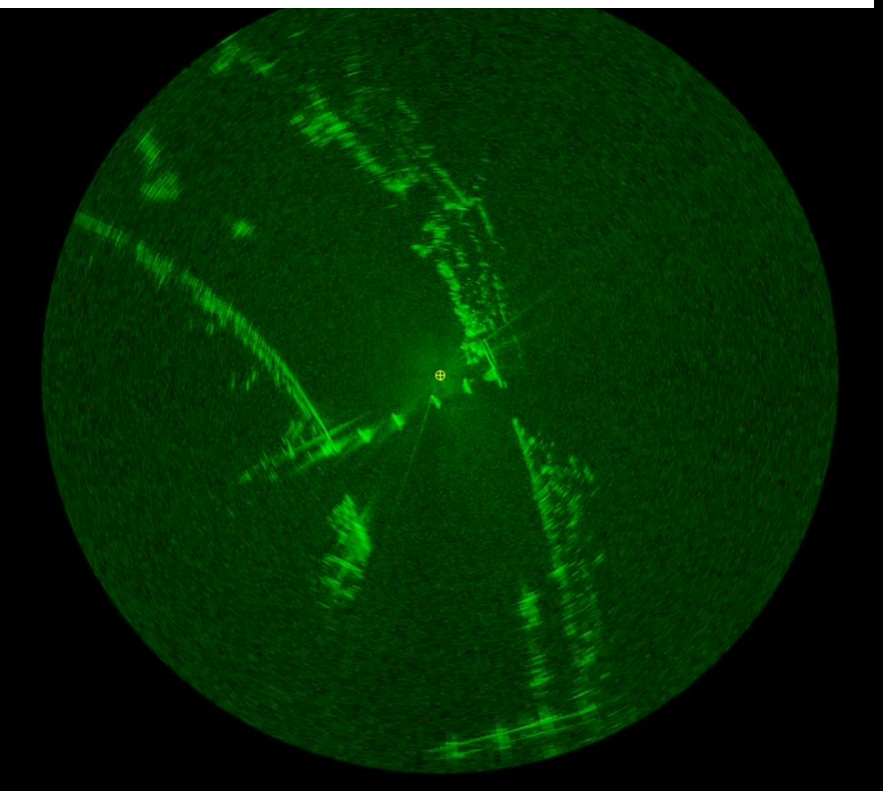

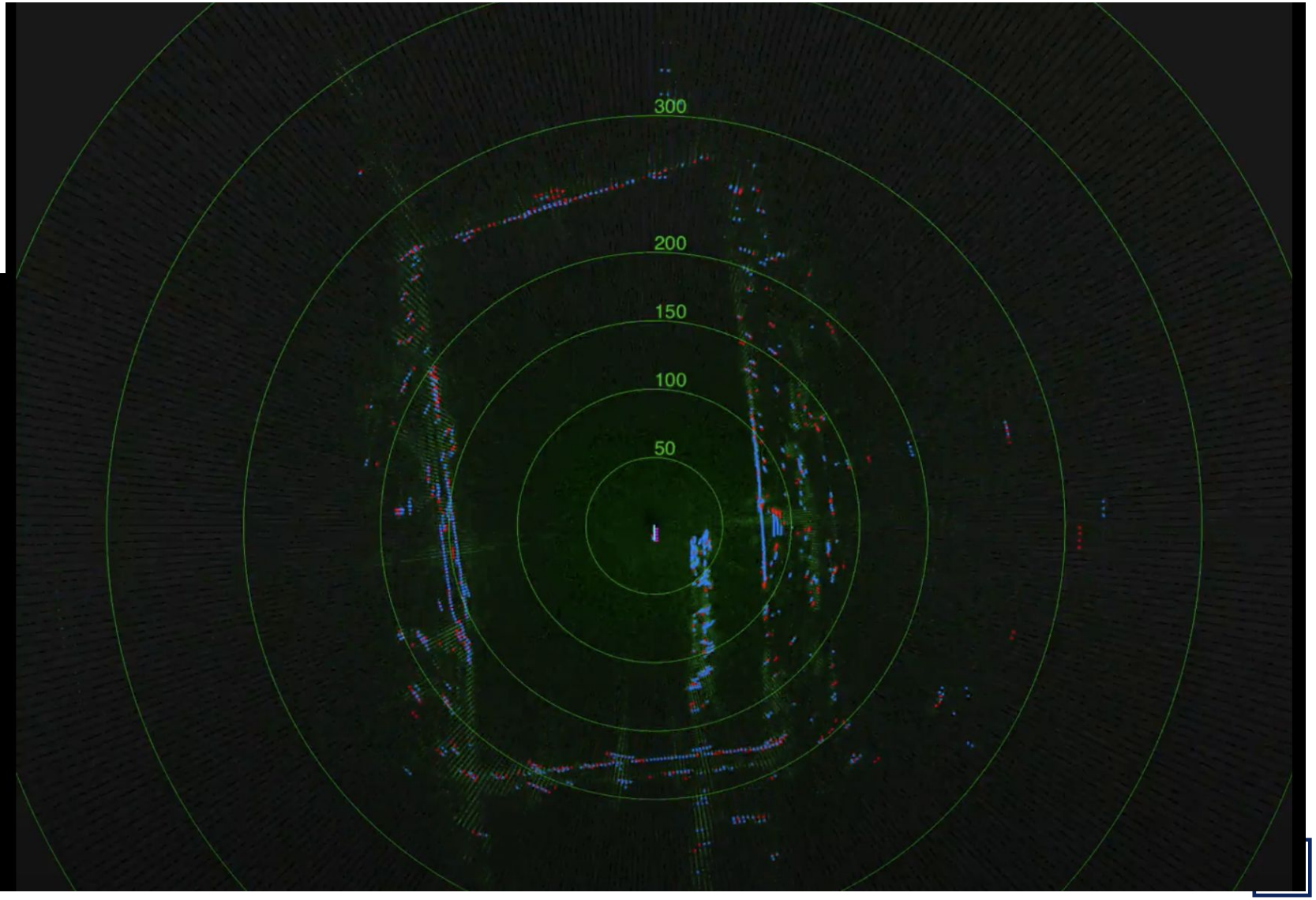

Terran360 in Harbour

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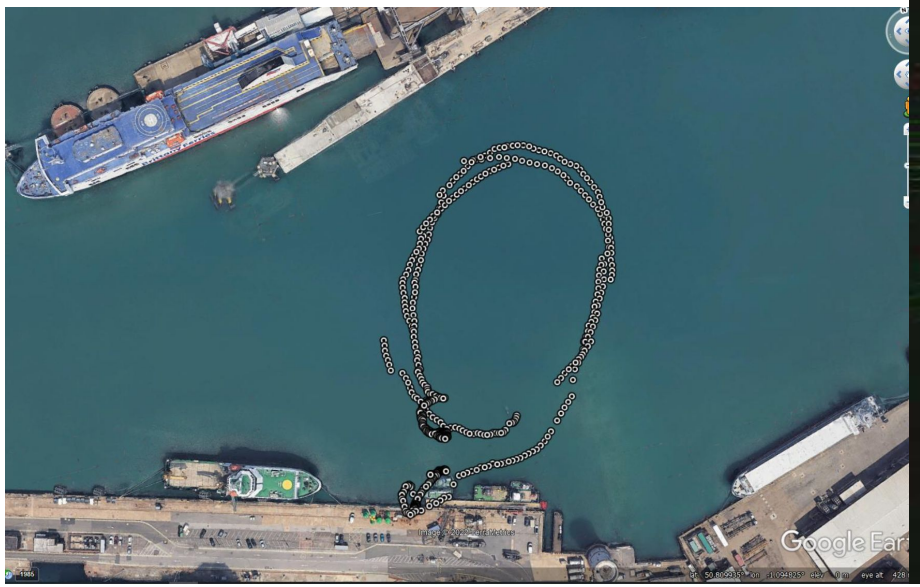
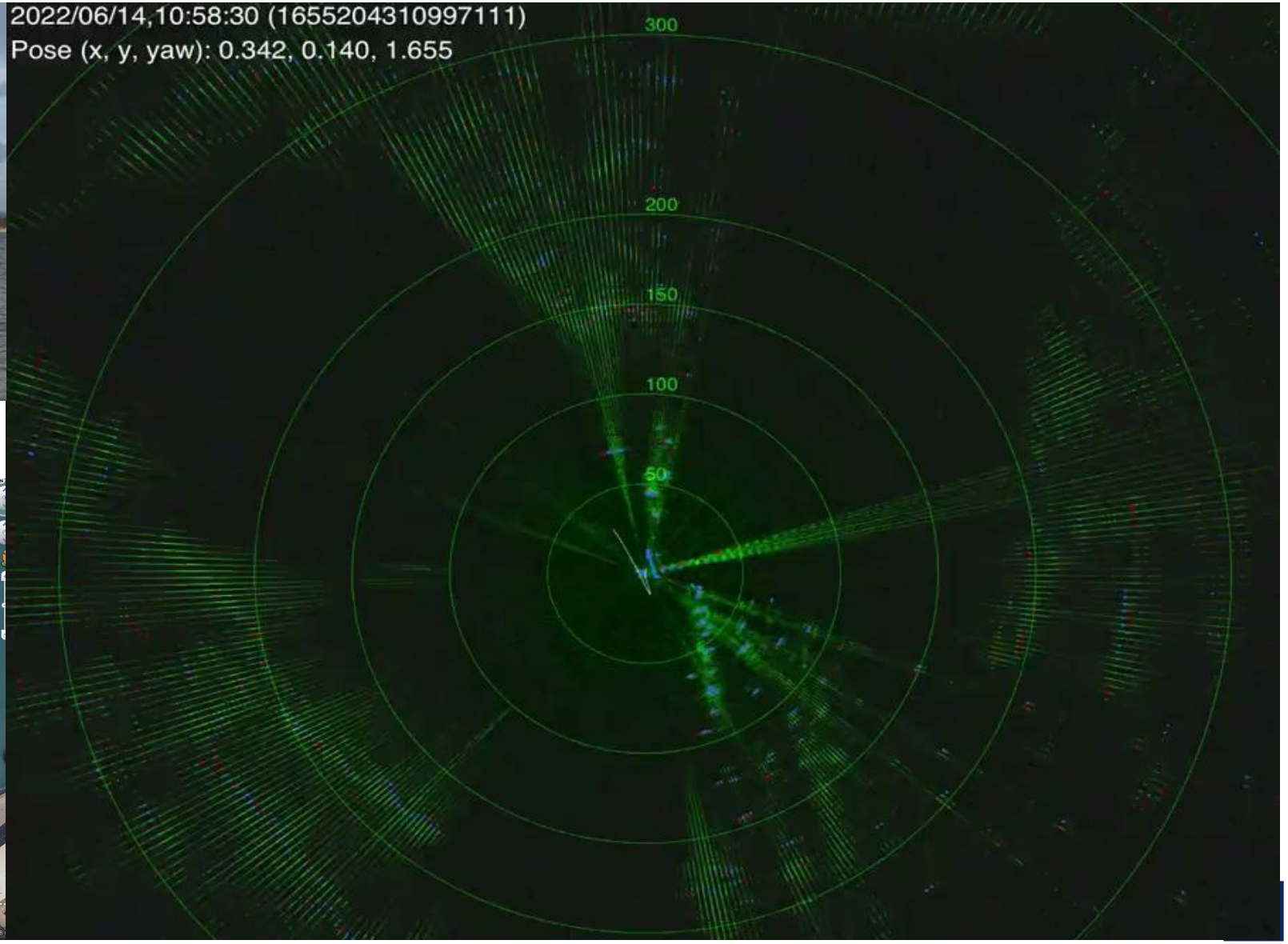


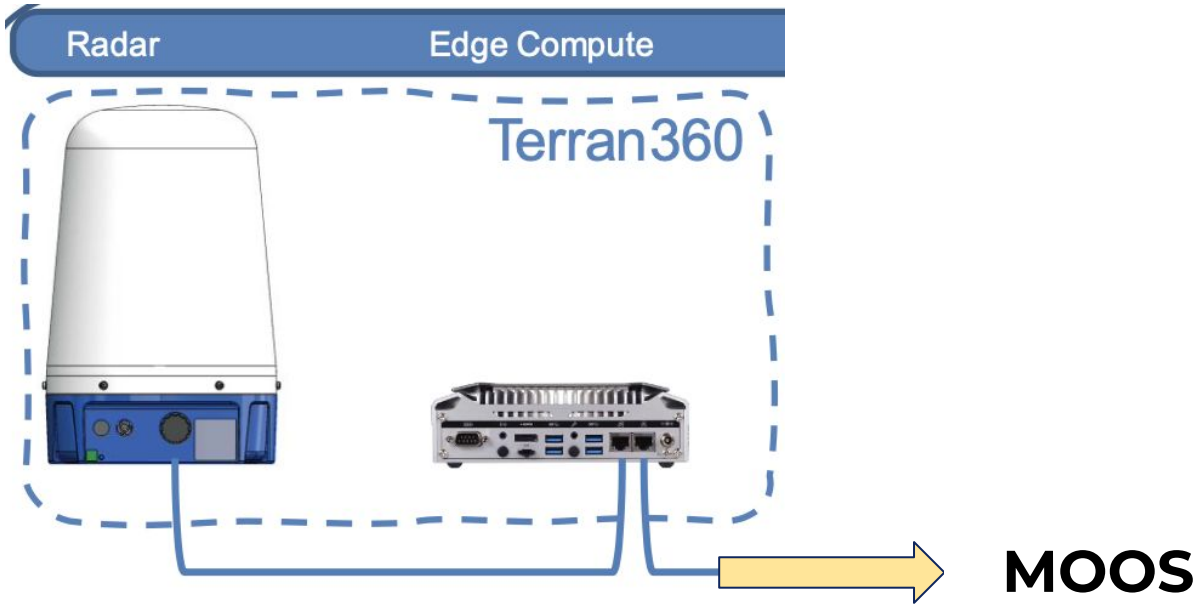


Performance and Accuracy

- Accuracy of < 10cm in marine environments.
- Map size of < 30MB /km/experience
- Low power and compute requirement
- Can work at large offsets (e.g. 100m) from the map

Integration

- Navtech Radar sensor - CIR or CAS (smaller)
- Small low-power compute unit
- MOOS compatible !
- Publish NMEA style messages.
- Optional = other sensors e.g. GPS (for comparison).



Integration

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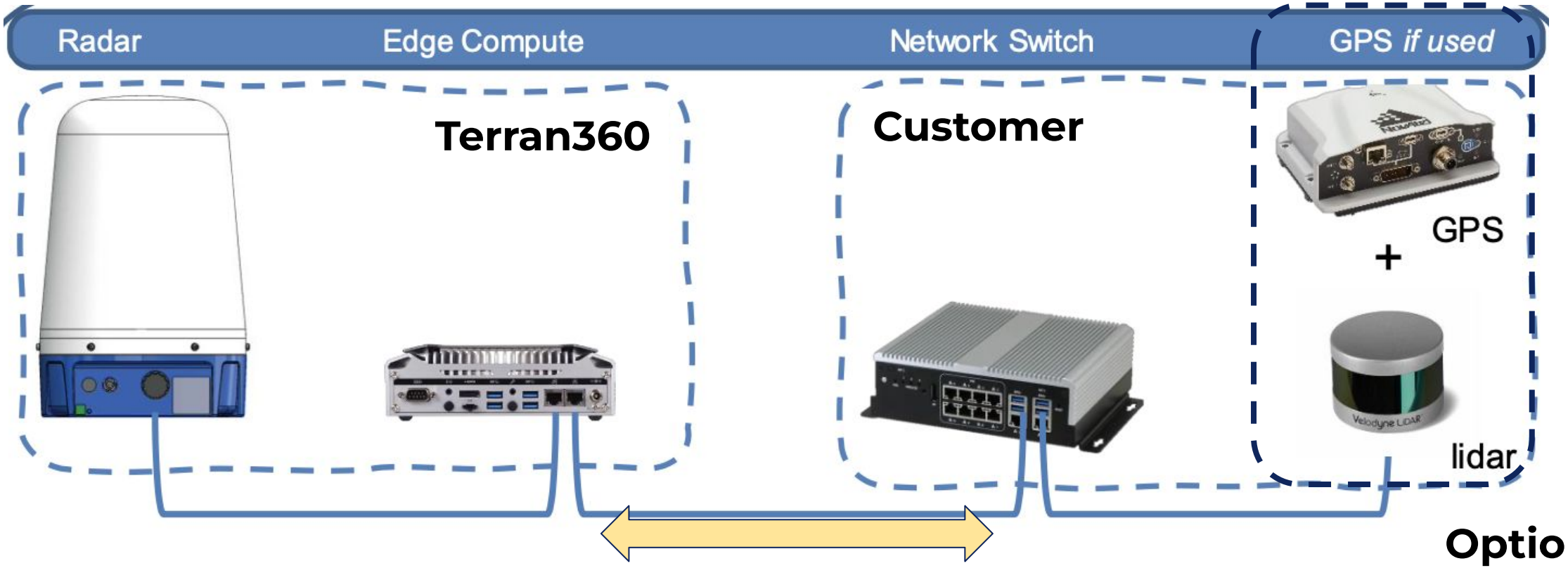

Radar Perception

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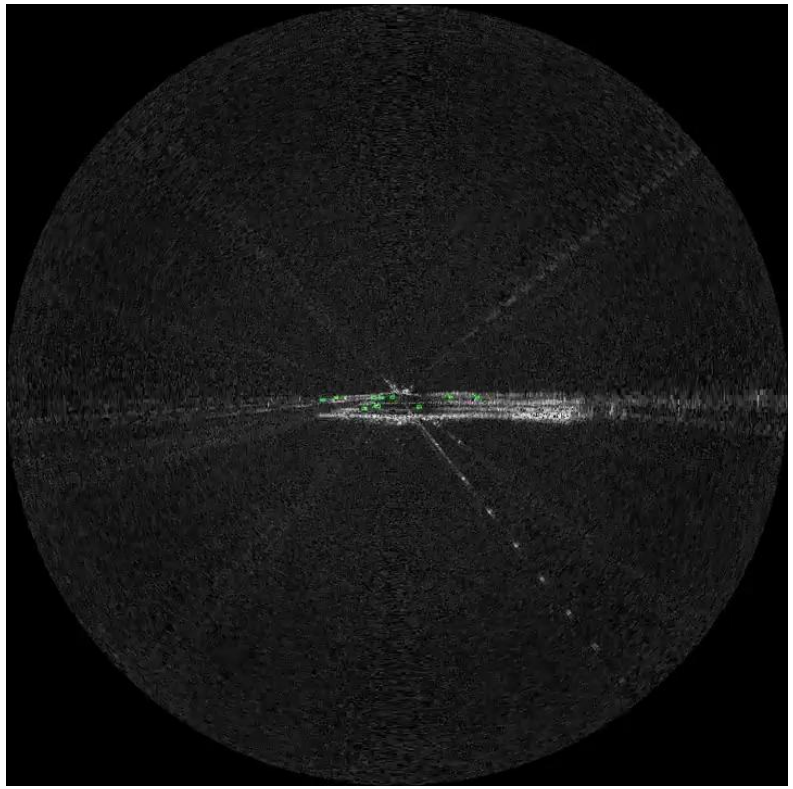

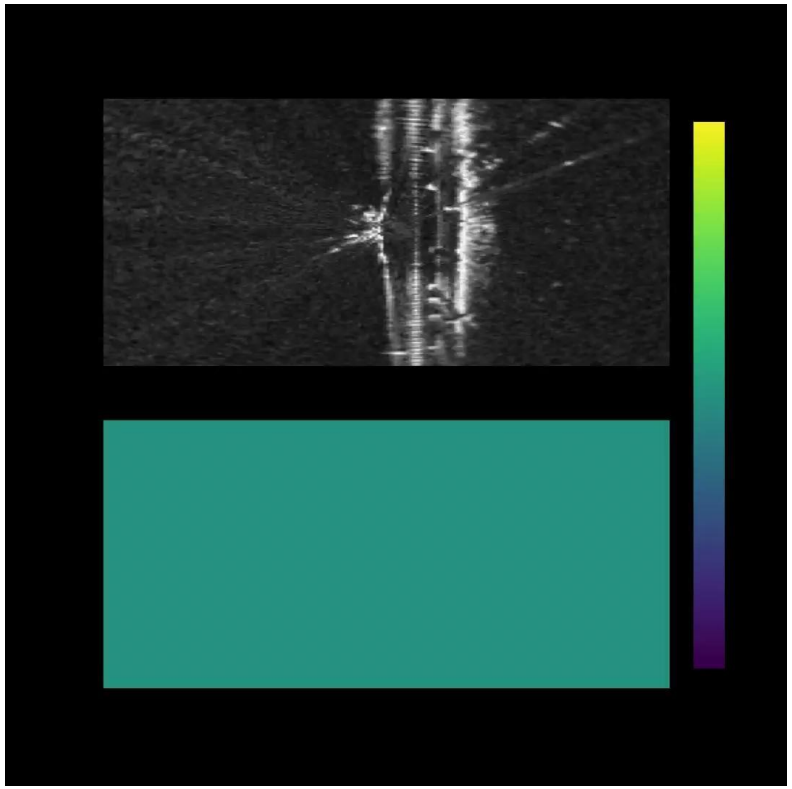

Thank you for your time

Please contact us for further information

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