LOOPE-Oil

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Presented by

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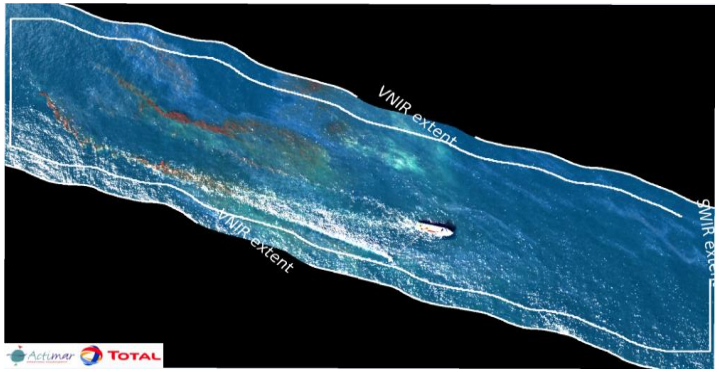
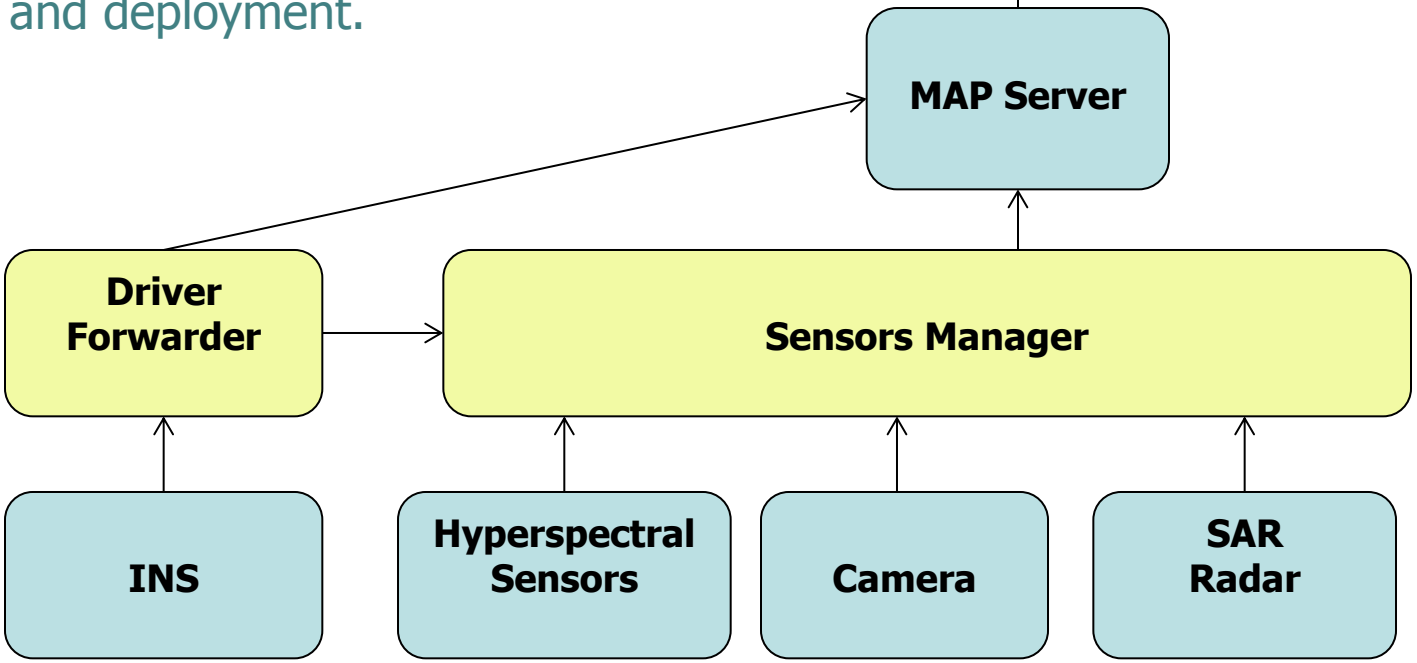
- **Actimar's Earth Observation group** conducted many airborne campaigns around the world and has a strong experience of the airborne observation and the mapping of oil spills using hyperspectral sensors and high resolution digital imagery
- **Principle:** An airborne system able to characterize oil spill thanks to visual observation and innovative sensors output.
- **LOOPE concept:** Live airbOrne Observation and interPretation of the Environment. Lightweight, compact and modular airborne system providing a full tactile GUI for pad.
- **LOOPE-OIL:** LOOPE applicative system allowing to characterize the observed oil spill and able to generate in real time a full report with sensors output information



Oil spill image from sensor's output

Carrier plane (Beech KA90)

- Lightweight software libraries used for communication and GUI
- Lightweight sensors and devices for a fast integration and deployment.

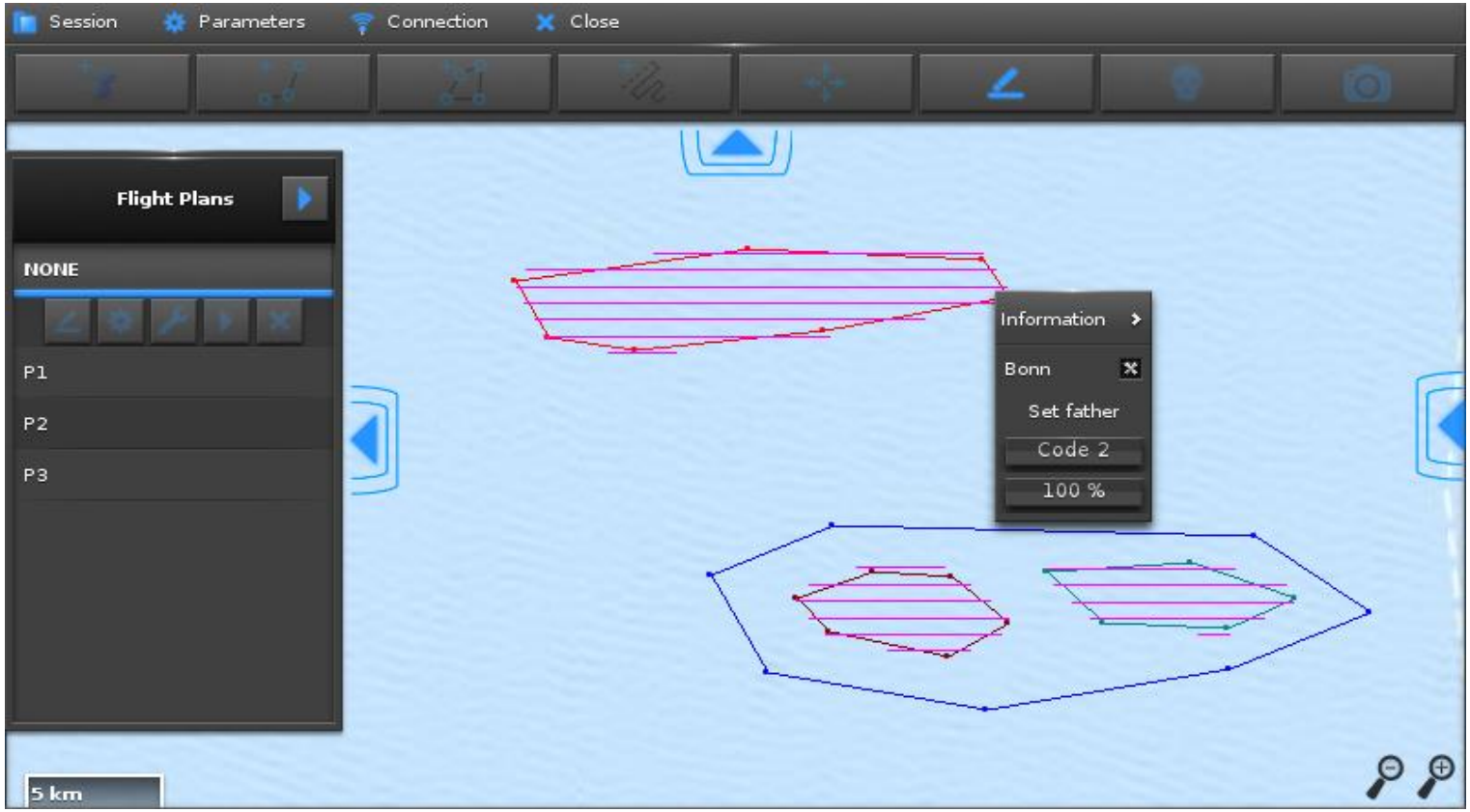


LOOPE-Oil architecture

GUI : GIS panel

Oil characterization according to Bonn agreement (thickness codes, ...) and cover percentage

Live flight plan generation for imaging sensors



Retractable menu to optimize space

Multiscale

Features easily accessible

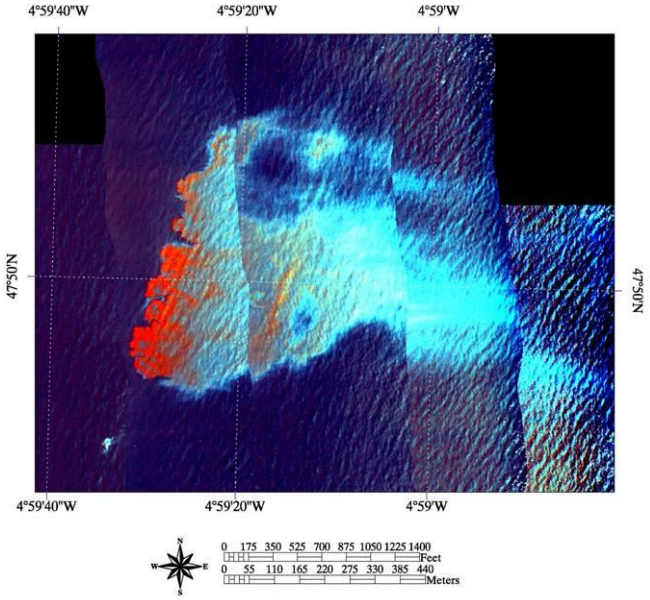
Vertical high resolution digital imagery and hyperspectral sensors

+

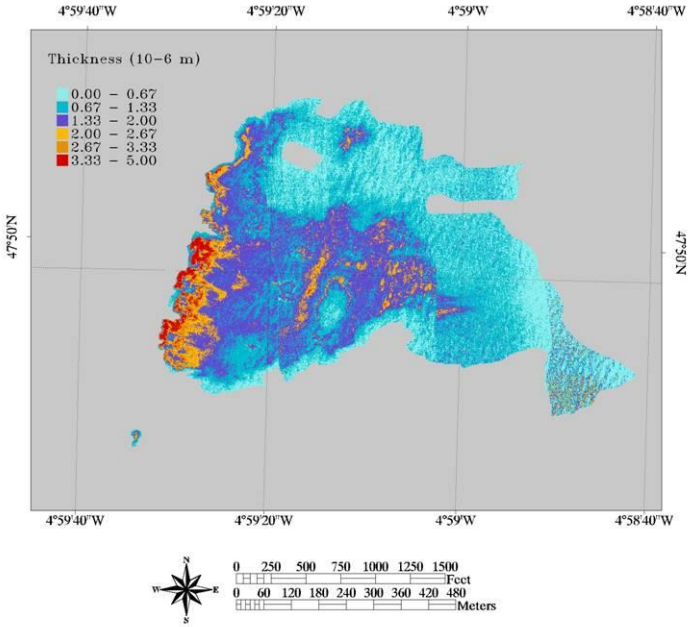
Standard DSLR sensor head (<3 Kg)
Real time production of georeferenced photos.
For a manual first guess of oil spill contours

VNIR and SWIR sensor heads (<12 Kg)
Measured spectrums
400 -> 2500 nm
Used for automatic estimates of enhanced oil slick parameters

Extraction of informative parameters



Processing of Hyperspectral VNIR + SWIR data



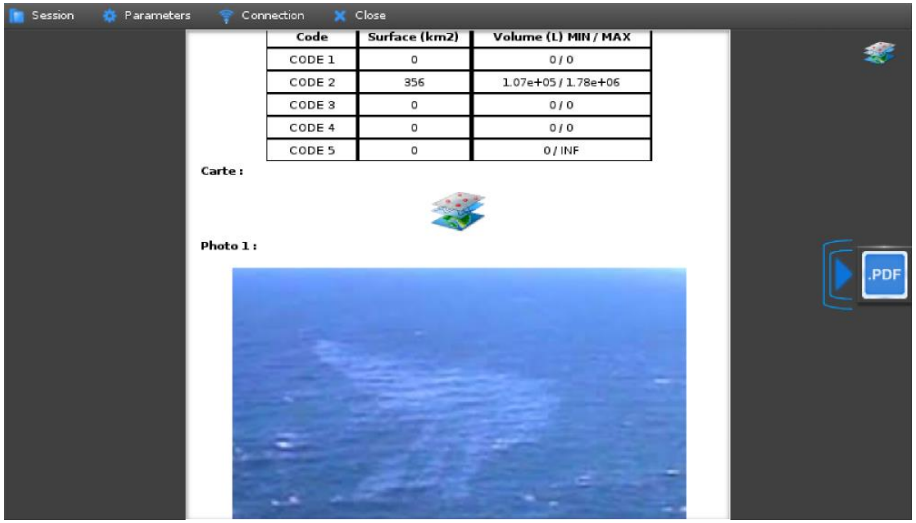
Oil thickness + emultion rates + pseudo-Bonn code maps

- Volume calculation
- Decision making :

  for example use of dispersants

Coming features

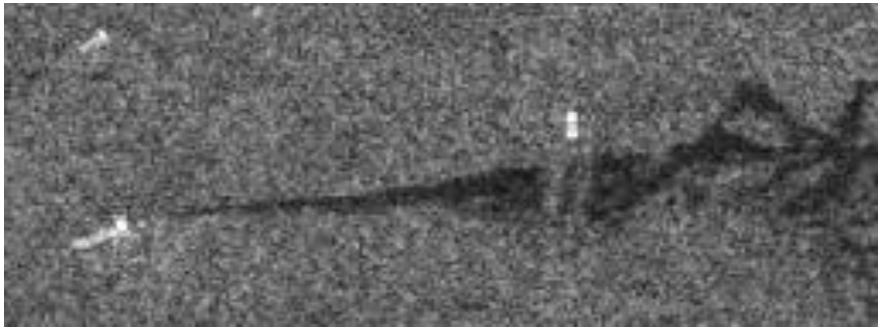
- Oil type identification.
- In-flight communication of the reports to a ground control station.
- Harmful liquid substance mapping with hyperspectral imagery
- Compact radar sensor management.



Loope-Oil reporting GUI

SAR radar

-Radar :Weights from 2 kg up to 50 kg (Available on UAV's)
- Aircraft: minor modifications, STC available for external baggage compartment



SAR image from satellite

A microwave imaging system which can produce high resolution image of the Earth is the **synthetic aperture radar (SAR)**. The intensity in a SAR image depends on the amount of microwave backscattered by the target and received by the SAR antenna. Since the physical mechanisms responsible for this backscatter is different for microwave, compared to visible/infrared radiation, the **interpretation** of SAR images requires the knowledge of how microwaves interact with the targets.

- **Innovative approach:**
  - **Sensors with new information,**
  - **Flexibility of the system, can be installed on light aircrafts**

- **Excellent ratio cost/efficiency**

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