2 Use cases for a Modular Payload Computer Concept:

#1 On-Orbit Space Debris Detection

#2 On-Orbit Maritime Target Detection

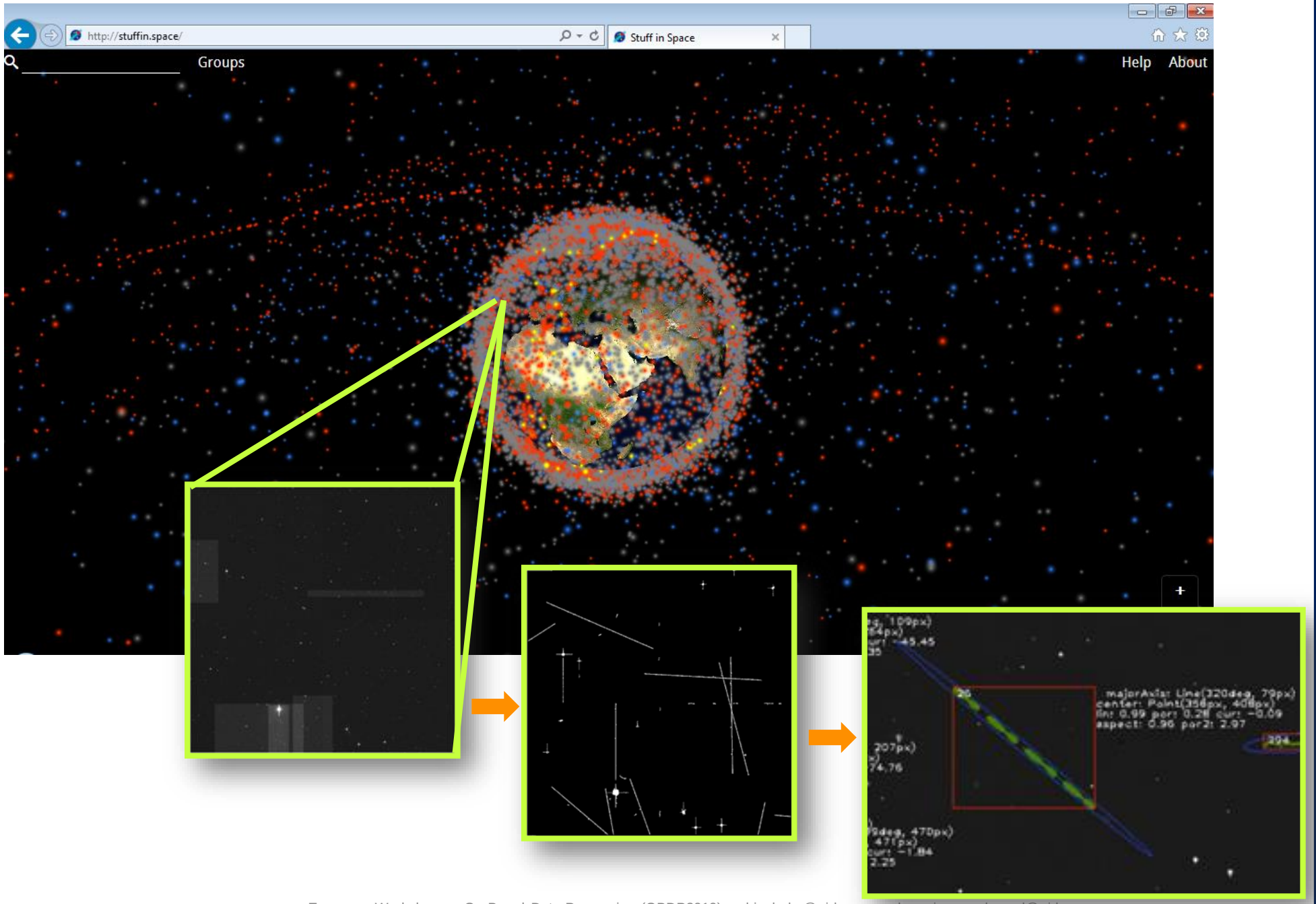
European Workshop on On-Board Data Processing (OBDP2019)
25 Feb 2019, 08:00 → 27 Feb 2019, 18:00 @ ESTEC

DEFENCE AND SPACE

Februar 2019
achim.helm@airbus.com
hans-juergen.herpel@airbus.com

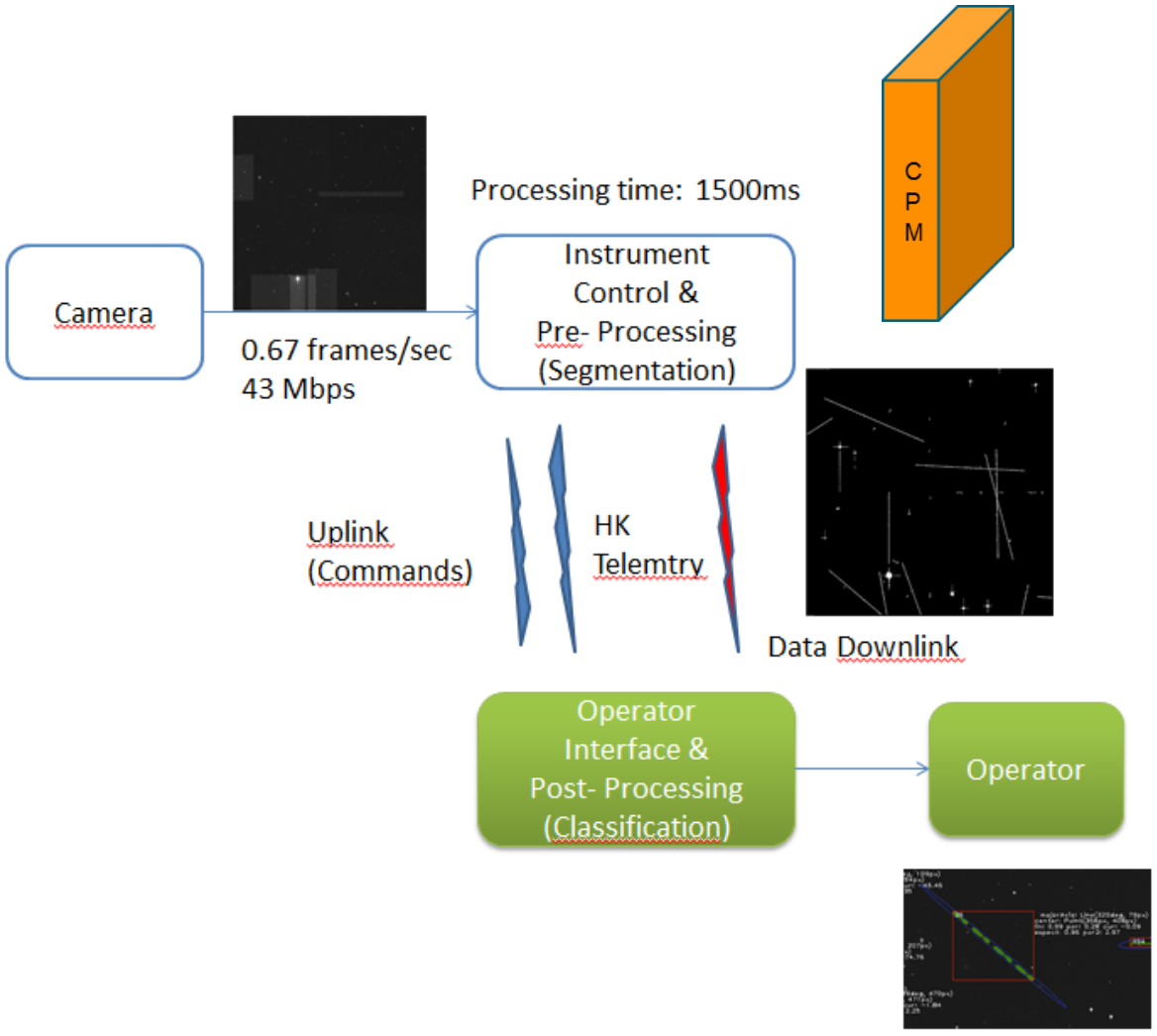
AIRBUS

#1 On-Orbit space debris detection



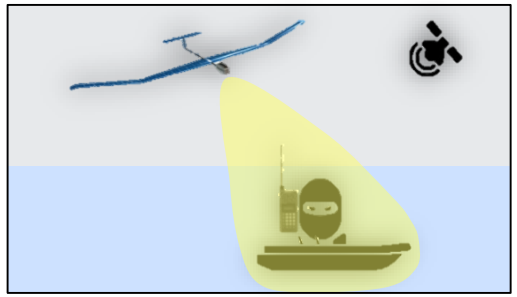
AIRBUS

#1 Required in-orbit data processing resources

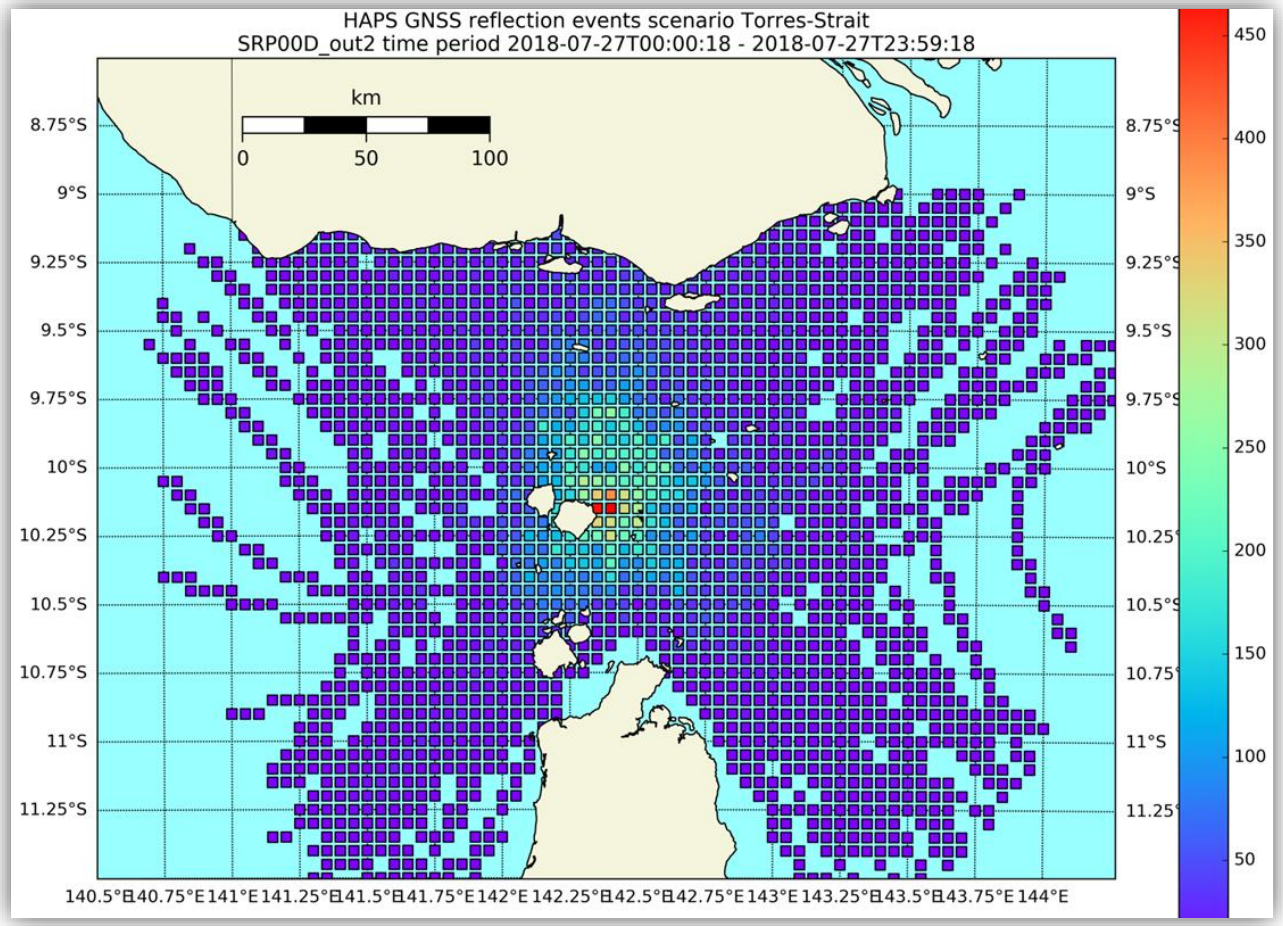


- Min. 0.67 frames/s 2K x 2K x 16bit
- Min. 43 Mbits/s image stream
- Max. 1500ms processing time
- Max. 5 min latency time for user product
- Max. 30 W power for payload
- Max. 5 kg mass

AIRBUS



Banana Boat,
Size12-16m,
Material fibre glass,
Velocity 50km/h
RCS M 3



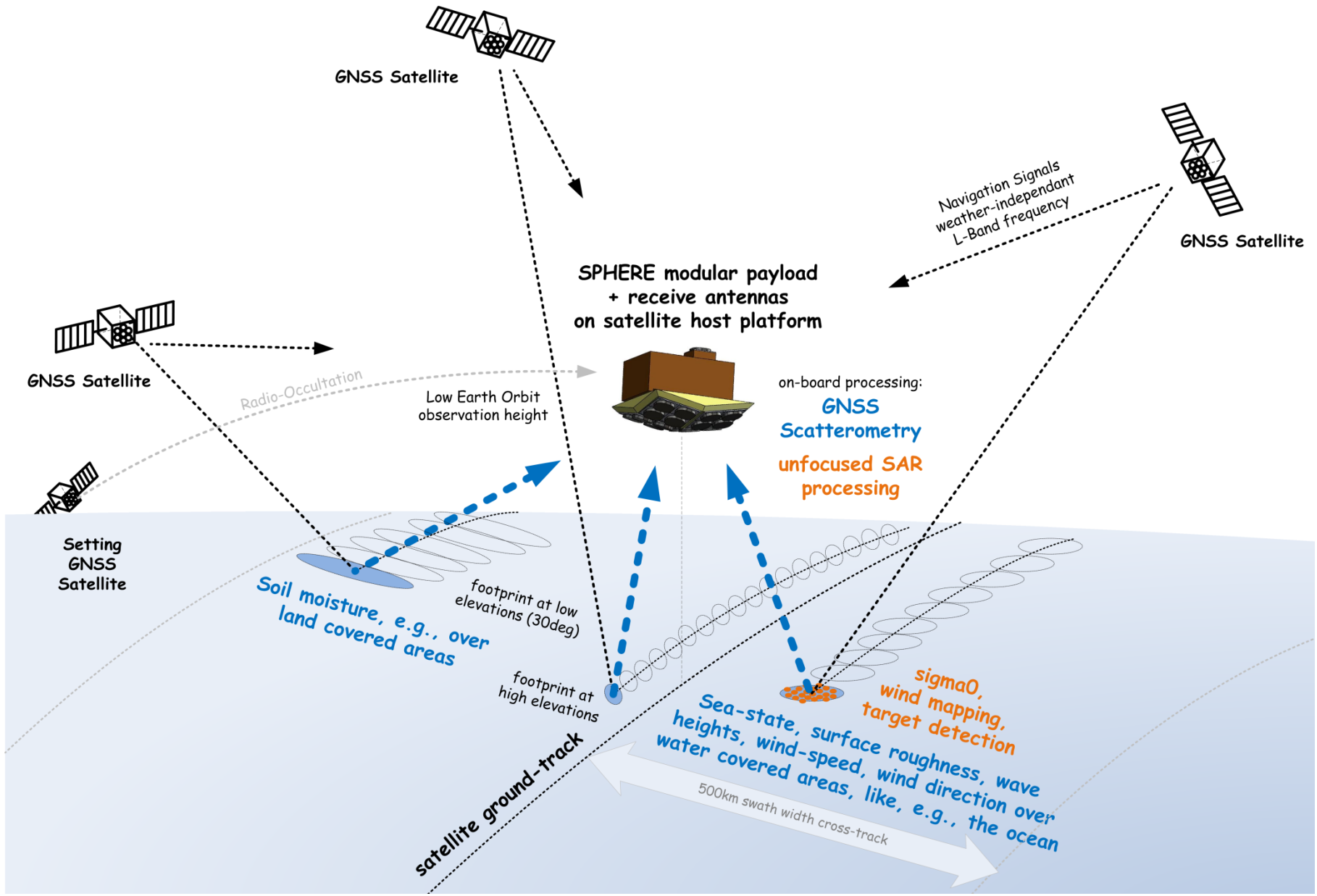
#2 Maritime Target Detection

Problem:

Illegal maritime activities constantly on the rise

illegal fishing, drug trafficking, weapon movement / proliferation, immigration

AIRBUS

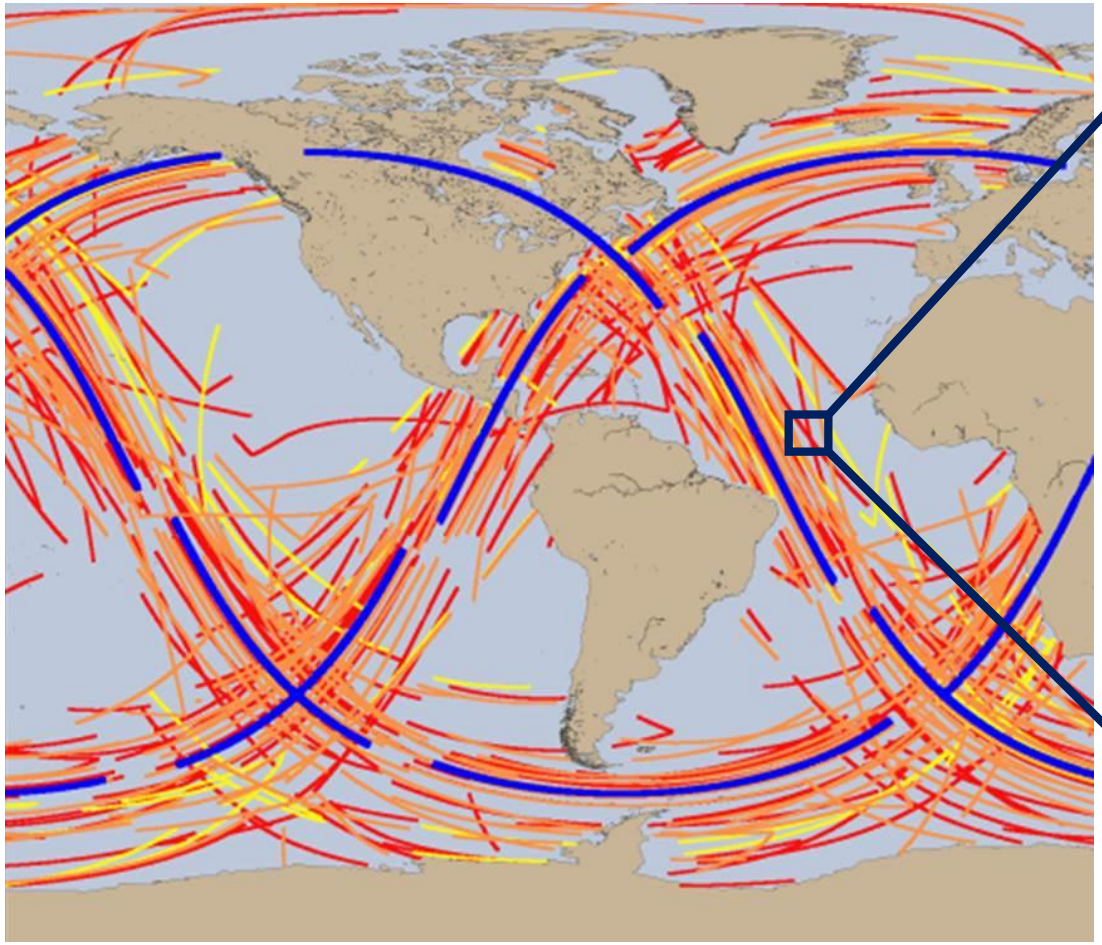


#2 Solution: use reflected navigation signals

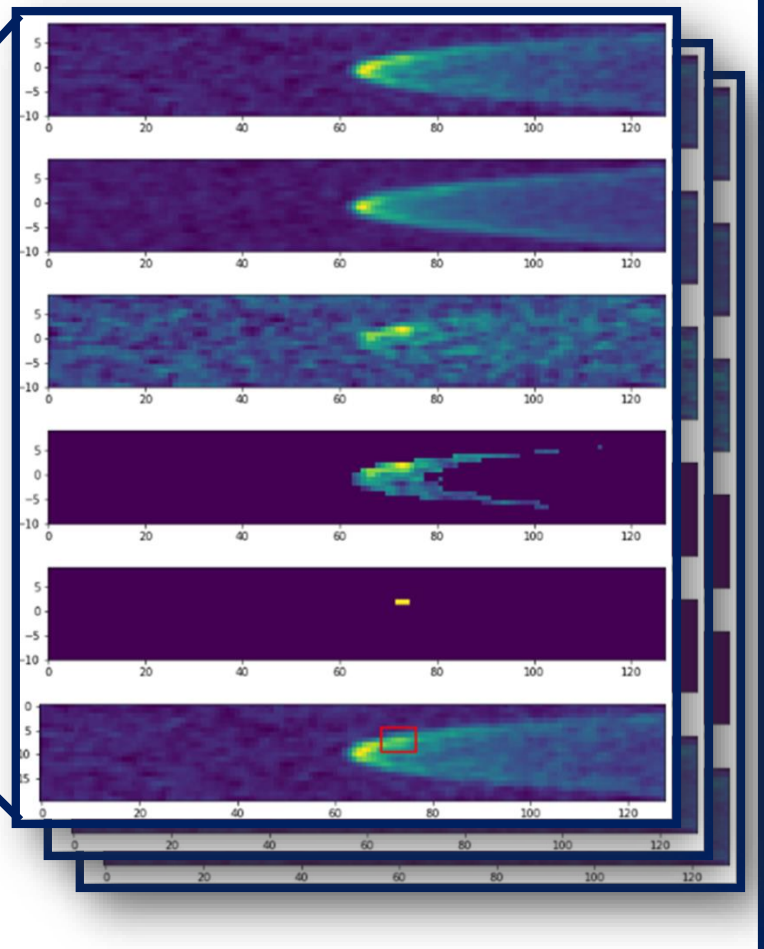
for persistent, weather independent monitoring of sea conditions from small constellation of observing platforms in HAPS or LEO

AIRBUS

Maritime coverage after 15 minutes with 18 LEO satellites constellation



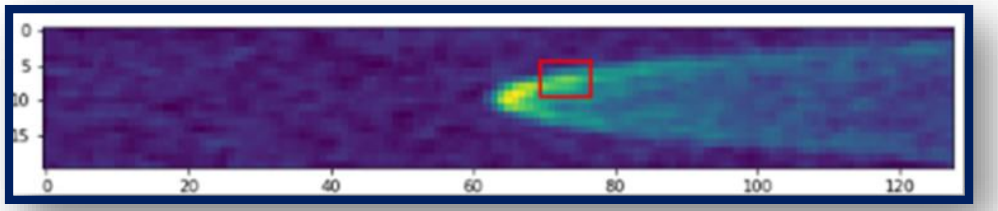
Processing
Delay Doppler Map (DDM)
For Target Detection

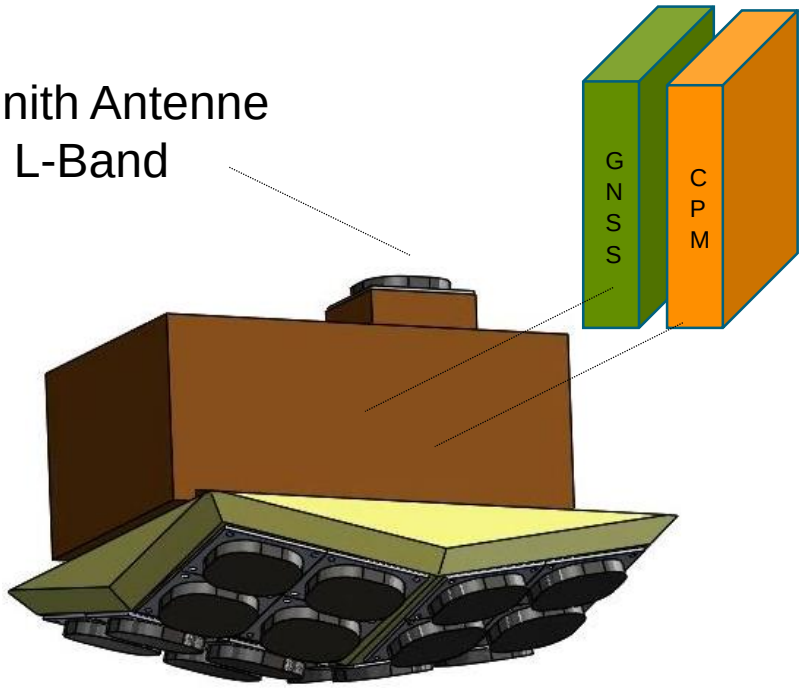


#2 On-Orbit Processing of Reflected GNSS Signals for Maritime Target Detection

AIRBUS

#2 Required in-orbit data processing resources





Per used satellite link & frequency band:

- Min. 212 signal correlators per DDM snapshot for signal acqusition
- Min. 2,56 Mbits/s DDM data per satellite link to process in-orbit
- Min. 8 – 24 parallel satellite links
- Max. 5 min latency time for user product
- Max. 30 W power for payload (10W for receiver and antenna, 20W for on-board processing)
- Max. 3 – 5 kg mass, depending on payload target platform

AIRBUS

Thank you

AIRBUS