



PT02_Aviso3_0008

Projecto Tipo I – Sentinel Data Reception

PT02_Aviso3_0009

Projecto Tipo IV – Oil Spill and Illegal Fishing



EDISOFT - Santa Maria, Açores

Estação para aquisição de dados de Satélite em território nacional

Projecto EEA Tipo I

Objectivo: **implementar a capacidade nacional para receber os dados do satélite europeu SENTINEL-1(Copernicus).**

Projecto EEA Tipo IV

Objectivo: detecção e monitorização de **derrames de hidrocarbonetos e pesca ilegal** em áreas oceânicas, baseada em **imagens radar do SENTINEL-1.**

28 Years Leading Edge Technology

Founded on May 23, 1988, EDISOFT has occupied a prominent position within the Portuguese Defense Industry;



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EDISOFT develops activities in the following domains :

- **Command and Control Systems for the Defence Industries**
- **Naval Platforms:**
 - Combat Systems;
 - Integrated Information Systems;
- **Maritime Security**
 - VTS/VTMIS Solutions for Coast Surveillance ;
 - Situational Awareness;
 - Maritime Surveillance using Earth Observation Satellites;
- **Space Systems:**
 - Tracking Ground Station (satellites and launchers);
 - Navigation (EGNOS / Galileo);
 - Satellite Communications;
 - Earth Observation;
- **Air Traffic Control Systems and Global Solutions for Airports;**
- **Geographic Information Systems and Strategic Collective Security Systems**



Key Numbers



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EDISOFT:

- 50 employees
- Exports - >70%
- I&D - 13%



THALES Portugal:

- 300 employees
- Exports - >80%
- I&D - 12%



THALES Group:

- 68.000 employees
- Presence in 56 Countries
- I&D - 20%

Shareholders



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The THALES Group, a World-leader in defence, security, space, aerospace and ground transportation markets - World-class technologies and the combined expertise of 68,000 employees in 56 locally based country operations make Thales a key player in assuring the security of citizens, infrastructure and nations.



17,5%

EMPORDEF SGPS SA is the Portuguese defence industries holding company responsible for managing State holdings in firms directly or indirectly involved in defence activities. The EMPORDEF Group represents a worldwide Portuguese presence - the business has clients and partners in Europe, Asia, North and South America and Africa.



17,5%

NAV Portugal's main mission is to provide air traffic services in the flight information regions (FIR) under Portuguese responsibility – Lisbon and Santa Maria, ensuring that national and international regulations are complied with in the best safety conditions, optimizing capacities, and emphasizing efficiency while not neglecting environmental concerns.

A THALES Group Company

Sede da EDISOFT



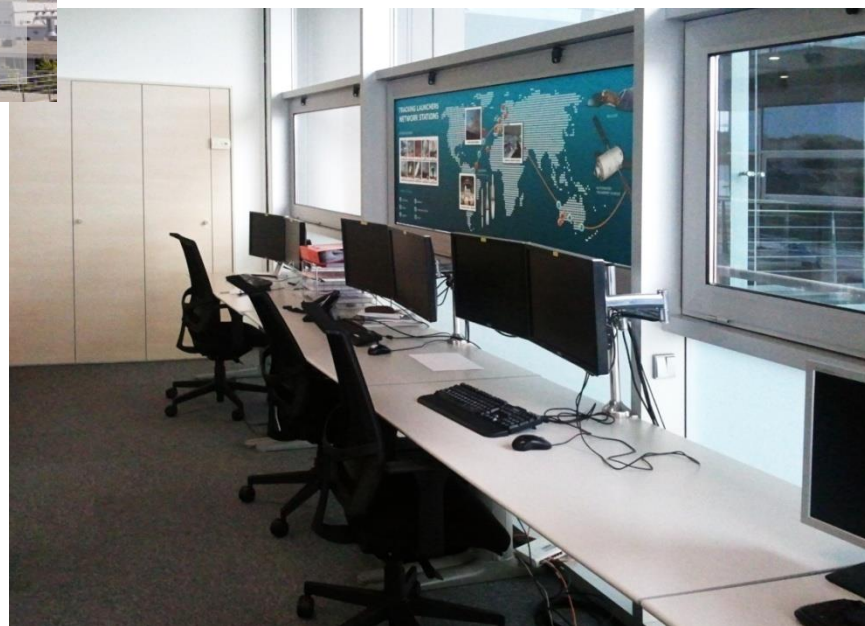
EDISOFT

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CENTRO OPERACIONAL
DE OBSERVAÇÃO REMOTA

REMOTE SENSING
OPERATIONS CENTER



Segmento Terrestre, Santa Maria - Açores



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Estação de Rastreio de Lançadores

- A estação faz parte da **rede ESTRACK da ESA**, bem como da **Arianespace Tracking Stations network**. Estas redes apoiam os lançadores **Ariane 5**, **Vega** e **Soyuz**;
- A equipa da EDISOFT é responsável pela **manutenção e operações de lançamento**.

Estação de Observação da Terra

- A EDISOFT instalou a capacidade de recepção banda X, bem como o processamento de dados SAR de forma a poder receber dados ENVISAT, RADARSAT-1, **RADARSAT-2** e **SENTINEL-1**;
- A estação faz parte de um grupo restrito de estações que presta **serviços CleanSeaNet**: operações diárias para a **EMSA**, de **detecção de navios e poluição marítima**.

Galileo Sensor Station

- Permite validar e garantir a qualidade do sistema GPS Europeu



Próximo Lançamento: 17 Nov 13:06:48 UTC



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4 Satélites Galileo (Sat. 15 a 18)



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European Global Positioning System

Visibilidade da Estação



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Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2009 AND
© 2009 Europa Technologies
© 2009 Tele Atlas

lat 37.135077° lon -25.152695° elev -3509 m

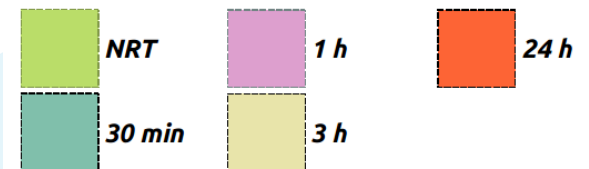
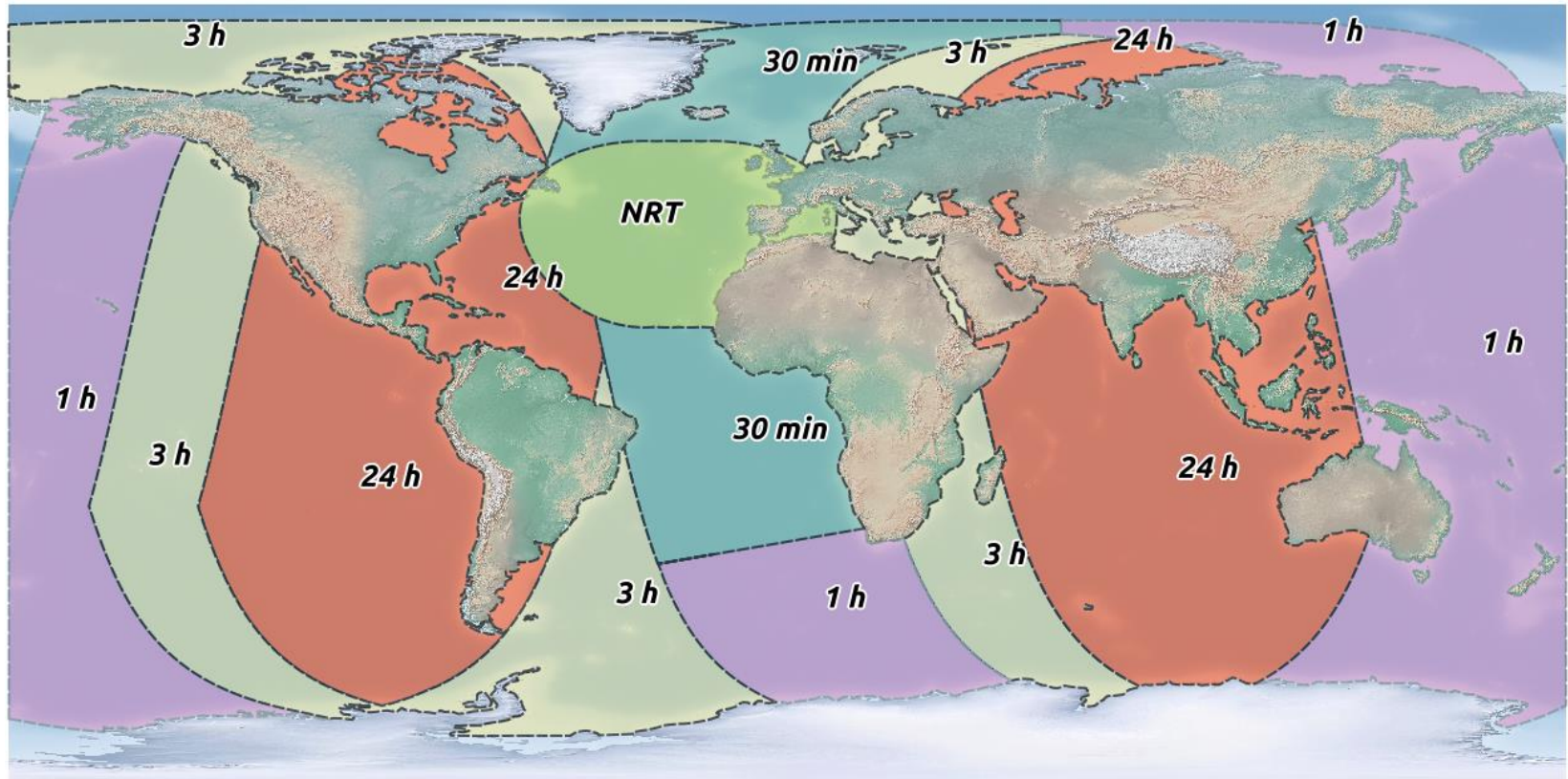
©2009 Google

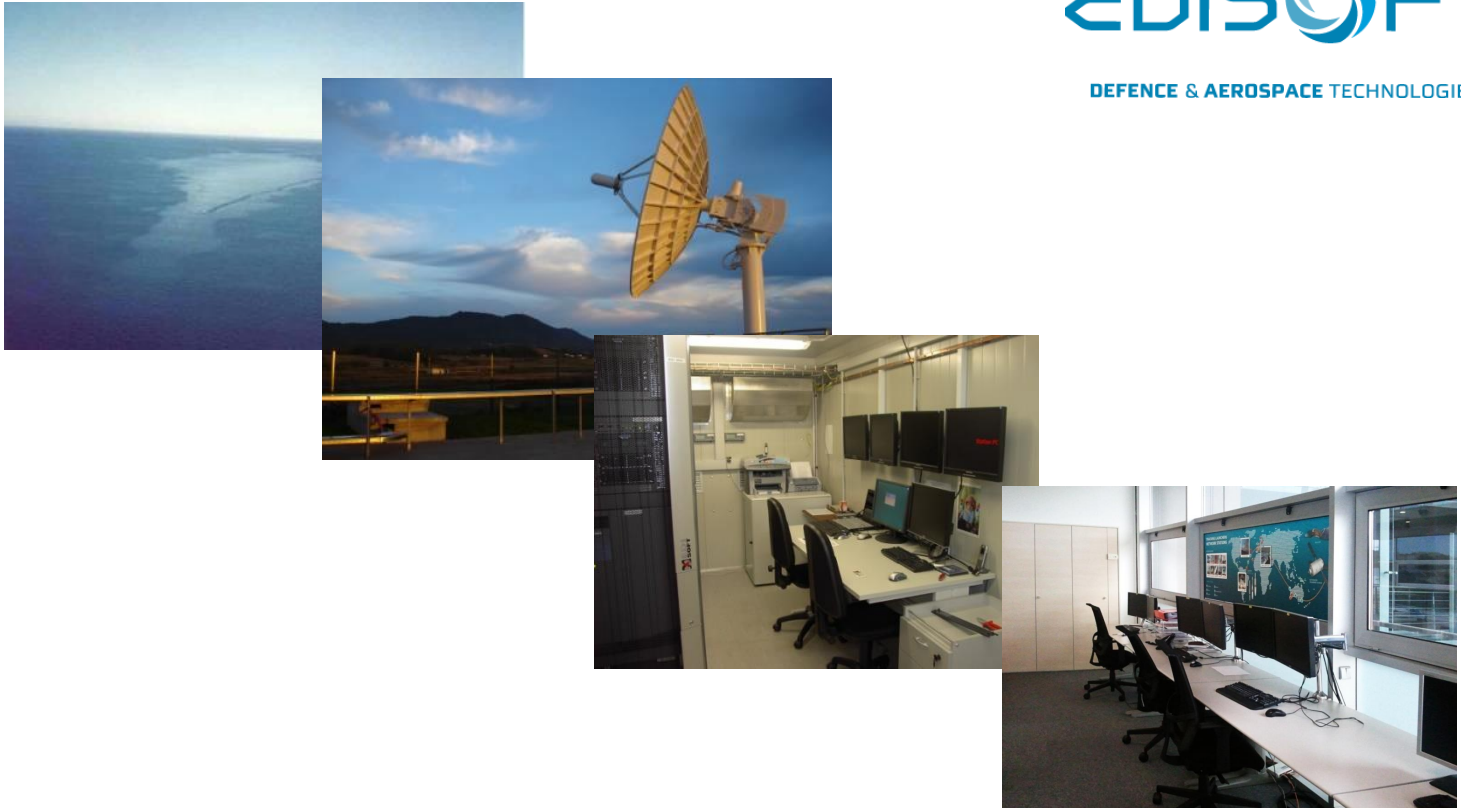
Altitude de visualização 8139.78 km

Tempos de Resposta



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Serviços Disponíveis

Serviços Disponíveis



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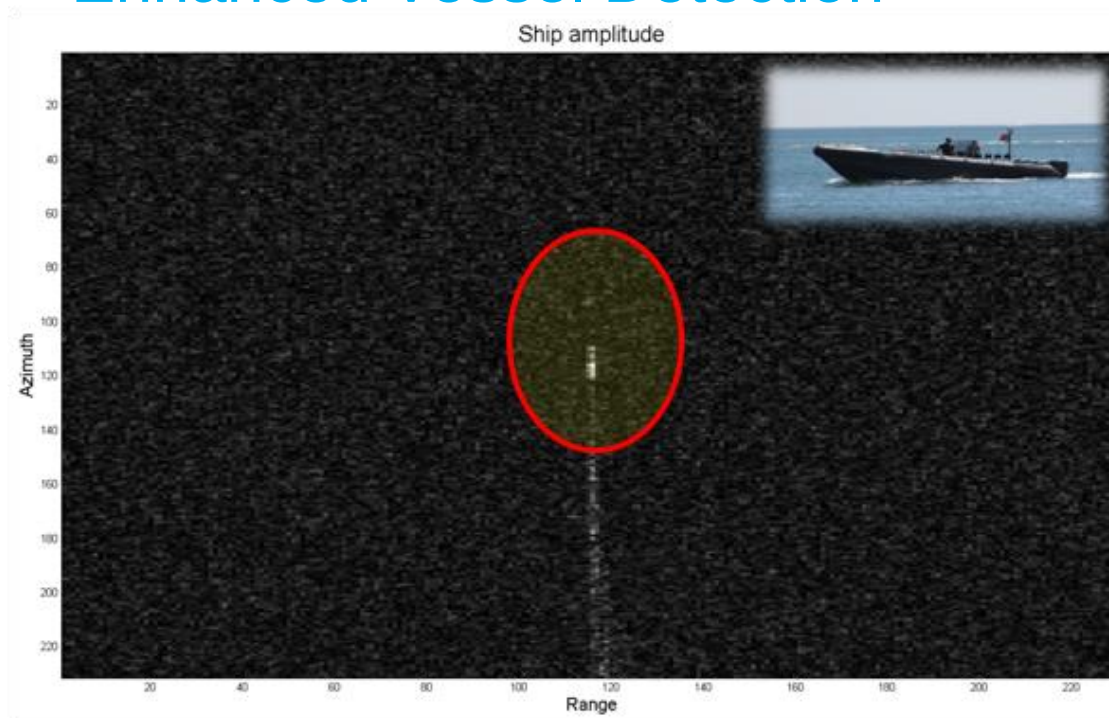
- **Serviços Base**
 - Recepção Banda-X
 - Processamento rápido (NRT)
- **Serviços Valor Acrescentado**
 - Detecção de Navios
 - Detecção de Poluição Marítima
 - Detecção de Actividades
 -  Change detection
 -  (ab)normal behaviour
- **Serviços de Disseminação**

Alguns exemplos

Enhanced Vessel Detection



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- **Increased accuracy** when detecting vessel targets
- Detection of **small sized vessels**
- Improved quality in vessel **characterization**
- Vessel **speed estimation** independent of a wake presence
- Capability in **classification** of big/medium vessels

Enhanced Vessel Correlation



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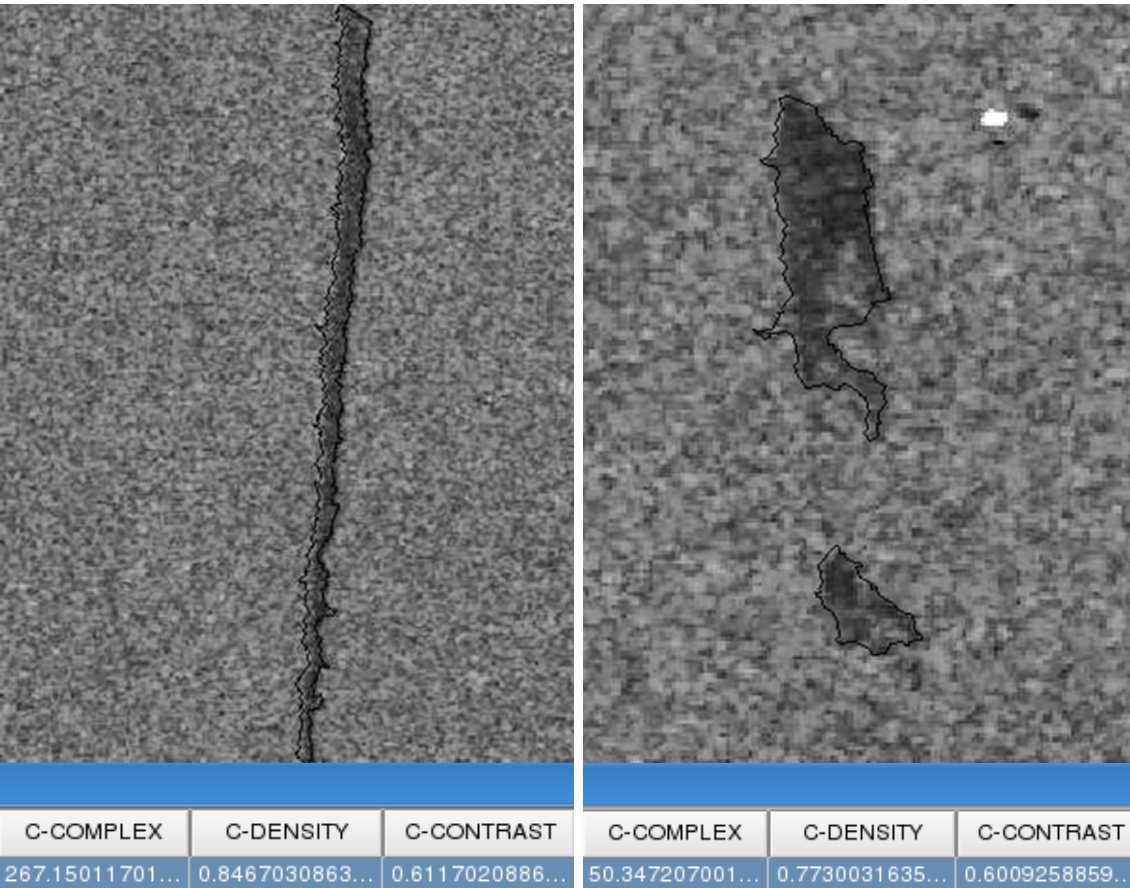


- **Increased accuracy** in the association AIS-Vessel
- **Forward and backward tracking** capabilities
 - Interpolation
 - Advanced experimental particle filter algorithms
- **Fast processing** time

Enhanced Oil Spill Detection



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- Results from AOSD **available to the operator** before the detailed analysis
- Increased speed on the oil spill **analysis process**
- Wider range of **slick classification characteristics extraction**
- **Progressive classifier** improvement updating it with new detected oil slicks
- **Oil slick thickness approximation** based on density, complexity and contrast.

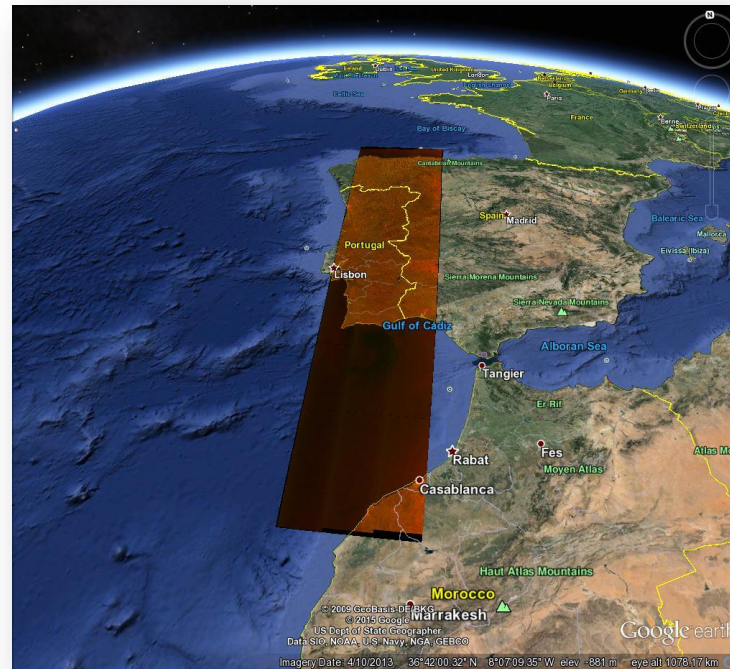
How to validate?

Vessel Detection with Sentinel-1A



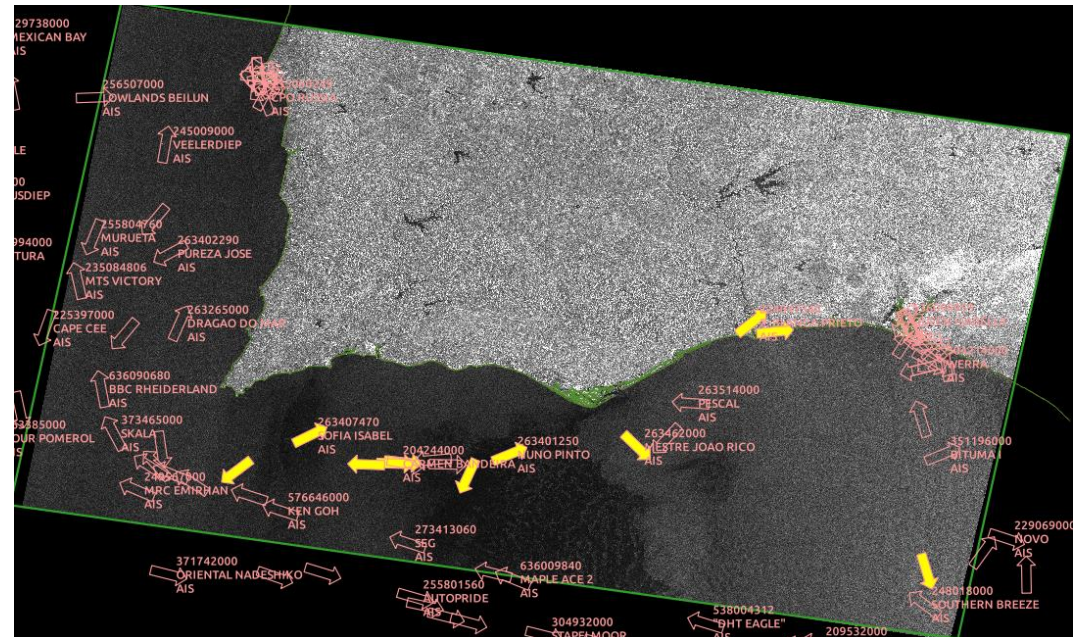
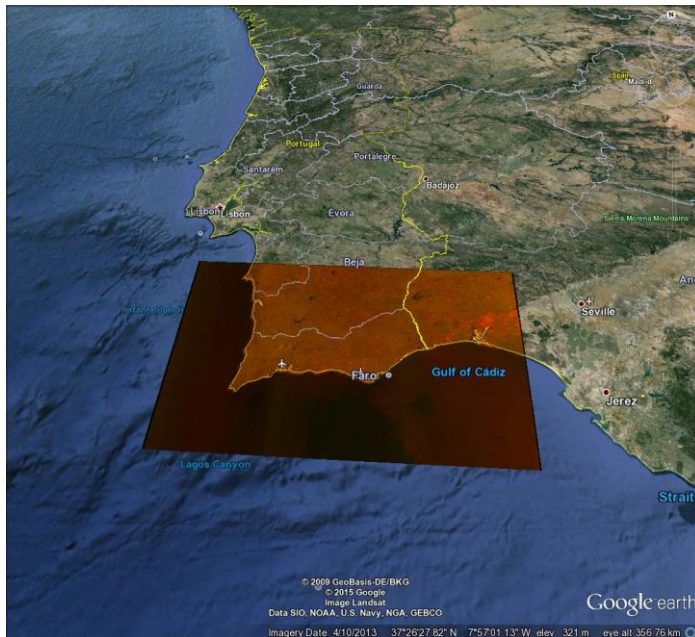
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- Sentinel-1A strip 2014-12-20 06:34:55
- Strip of 6 consecutive images, 250km wide



Detection of Fishing Ships with Sentinel-1A

- Data from AIS: several Fishing Ships have been identified in Portuguese south coast



Detection of Fishing Ships with Sentinel-1A



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- Fishing Ship (with 21x8m) was detected
- Saturno was identified by AIS

IMO: -

MMSI: **263402350**

Call Sign: **CUFC7**

Flag: **Portugal (PT)**

AIS Type: **Fishing**

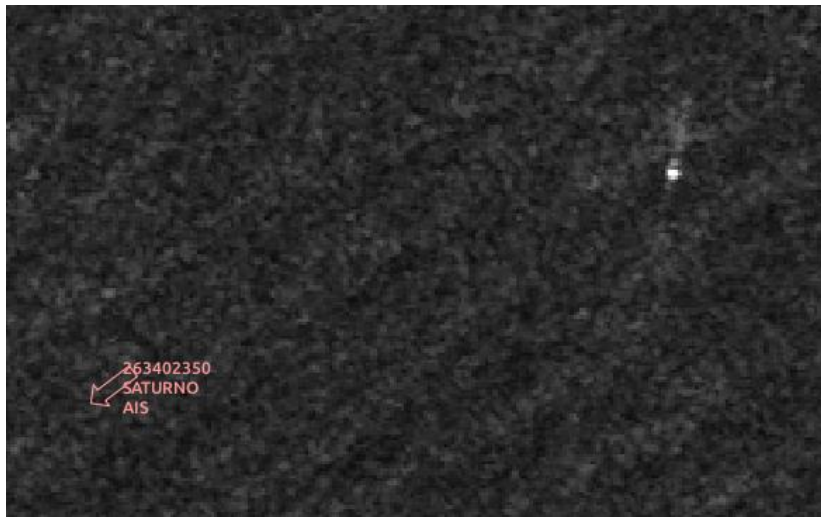
Gross Tonnage: -

Deadweight: -

Length × Breadth: **21m × 8m**

Year Built: -

Status: **Active**



Detection of Fishing Ships with Sentinel-1A



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- Fishing Ship (with 24x7m) was detected
- Sofia Isabel was identified by AIS

IMO: -

MMSI: **263407470**

Call Sign: **CULJ7**

Flag: **Portugal (PT)**

AIS Type: **Fishing**

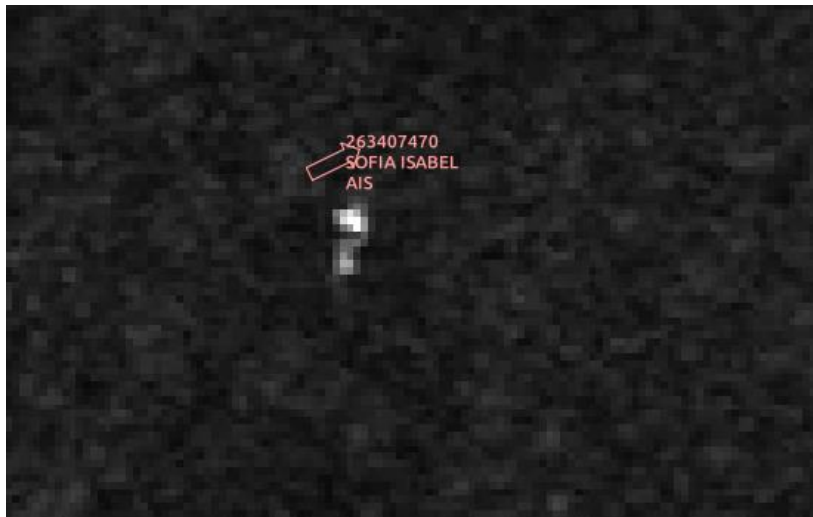
Gross Tonnage: -

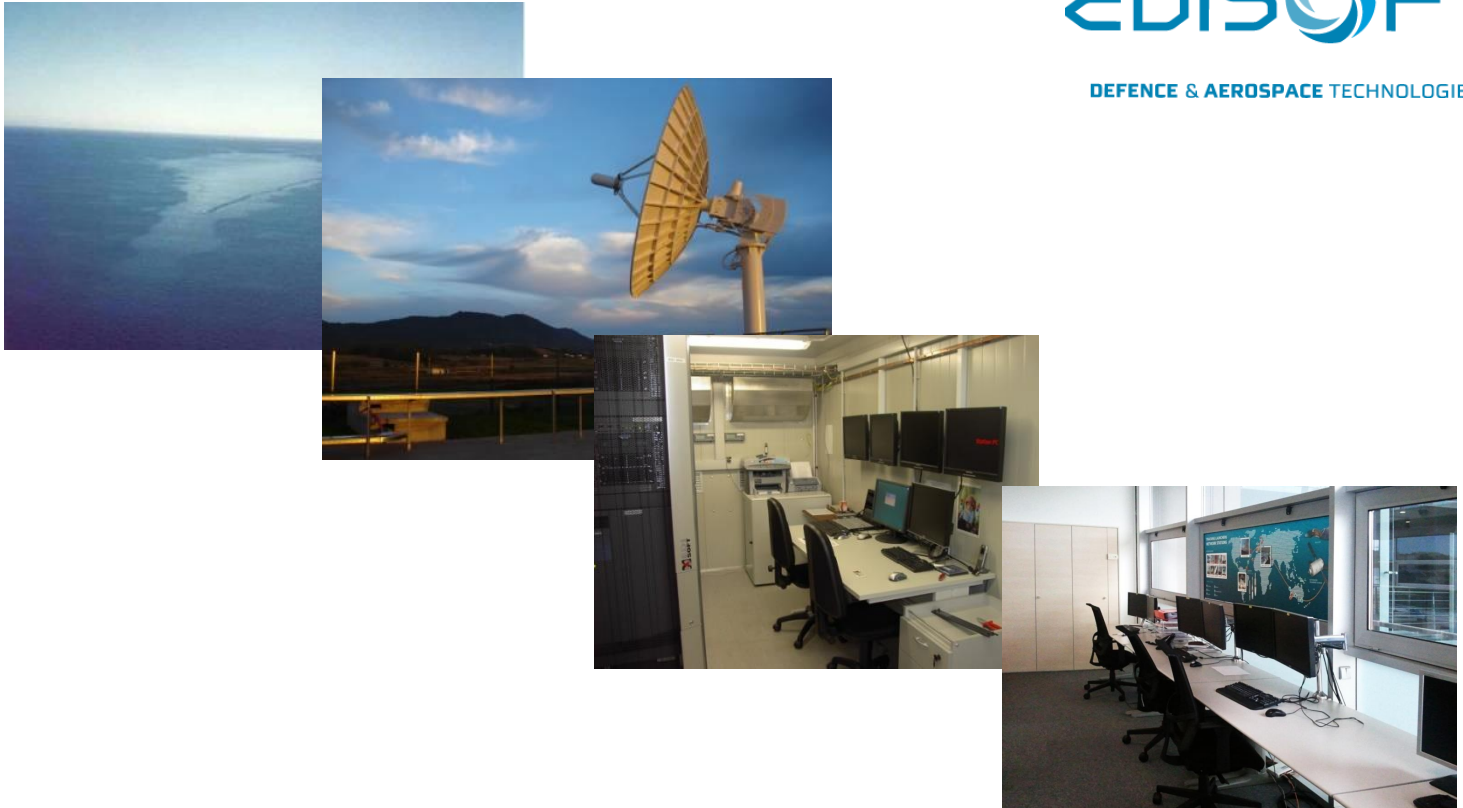
Deadweight: -

Length × Breadth: **24m × 7m**

Year Built: -

Status: **Active**





Integração Sentinel-1

Volume de dados (estima global)



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Global Coverage	Daily data rates	Yearly product archive
Sentinel 1A/1B	1.8 TB/day raw data	2.0 PB/year
Sentinel 2A	1.6 TB/day raw data	2.5 PB/year
Sentinel 3A	0.6 TB/day raw data	2.0 PB/year

Volume Estimado (Portugal)



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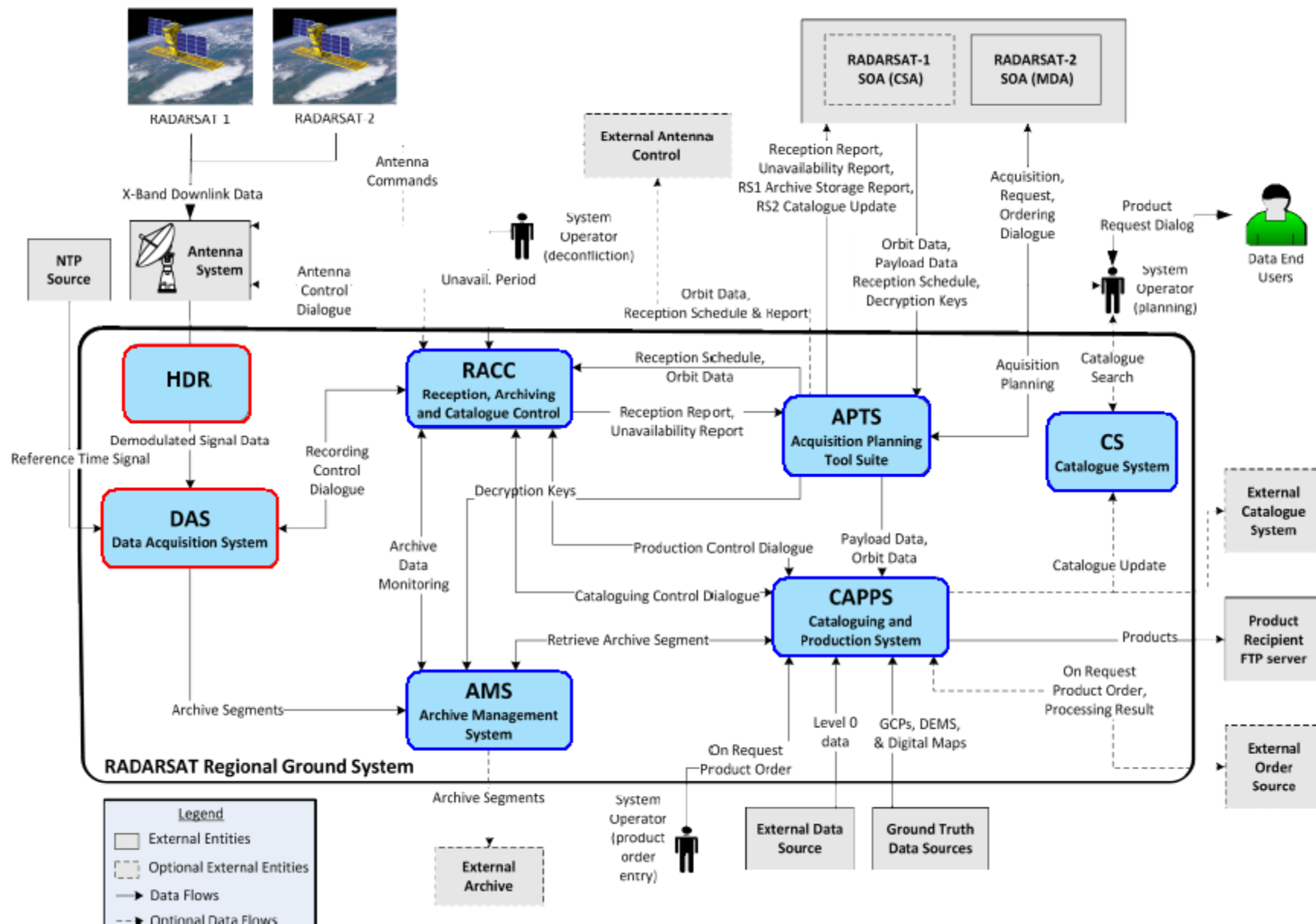
Portuguese EEZ	Daily data rates	Yearly product archive
Sentinel 1A/1B	70 GB/day raw data	76 TB/year
Sentinel 2A	60 GB/day raw data	68 TB/year
Sentinel 3A	25 GB/day raw data	25 TB/year

Capacidade Instalada



- **Infraestrutura**
 - 172 Cores
 - 1 TB RAM
 - 37 TB armazenamento
- **Cloud Computing**
 - Shared environment
 - Flexibility, Scalability, Elasticity, Reliability
 - Easy private => public cloud provisioning
- **Experiência recente: ESA DAS-LT**

RGS Sentinel-1 Upgrade



- SMA in the Collaborative Ground Segment
 - **ICD SMA - ESA**
 - **ICD SMA - EMSA**
 - **ICD SMA - Local Mirror IPSentinel**
- **Reforço Equipamentos**
 - **Concluídas (+76 cores, +912 GB RAM)**
- **Cadeia de Processamento**
 - **Cloud Privada**
- **Serviços Operacionais**
 - **Interfaces (ICD) e testes com a EMSA concluídos**
 - **Testes com o IPSentinel em curso**
- **Início das operações**
 - **15 Abril 2016**



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Obrigado

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