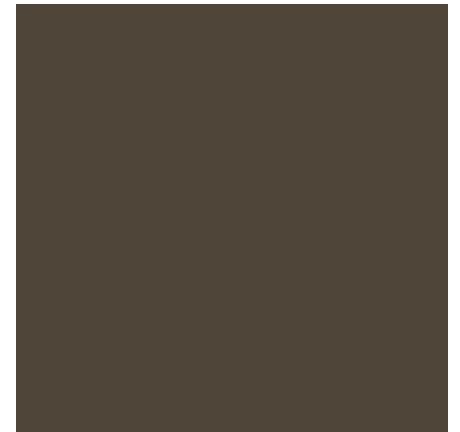


ARTES Applications Collaboration



APNorway Workshop
16 April 2015, NSC, Oslo

Miranda Saarentaus

Collaboration opportunities

Norway – Finland

- IAP DN FS – OILMON – Real-time oil spill detection and monitoring in the Baltic Sea – *starting FS*
- AWAA project - Advanced Autonomous Waterborne Applications Initiative – *Tekes funded project*
- VORIC project – Vessel Operations and Routing in Ice Conditions – *Tekes funded project*
- SharperSAT – *FS -> Demo*
- Results from brainstorming event from 10 March 2015



Real-time oil spill detection and monitoring in the Baltic Sea - OILMON

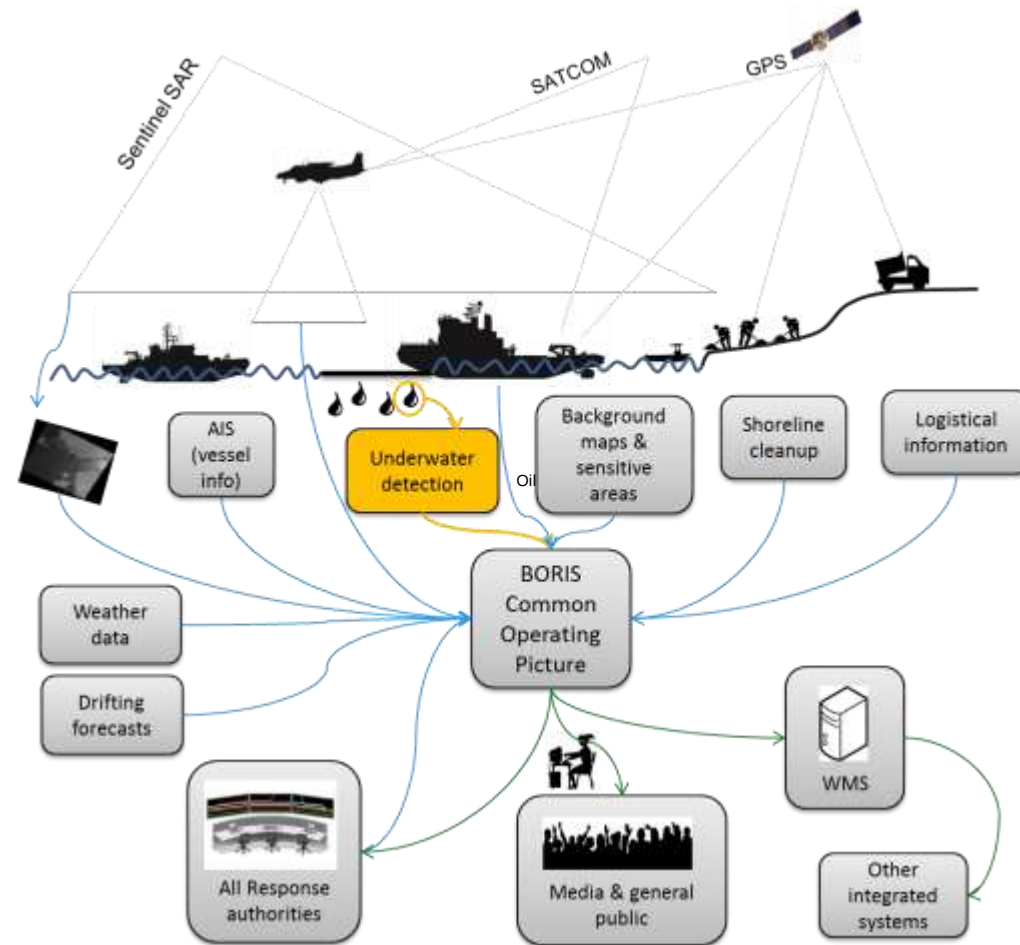
Project proposal for a feasibility study for the IAP
programme by ESA

SYKE - Luode Consulting Oy - Meritaito Oy

Objective

- The objective of the proposed activity is to assess the technical feasibility and the commercial viability of an integrated service that can be used to monitor the quality of the water by detecting **oil**. These technical solutions can eventually assist in tracking spreading of the spill.
- **Vision:**
- Oil sensors installed in
 - Ferry-Boxes on commercial vessels, oil response vessels, research vessels
 - Smart buoy network
- On-line data integration into the oil response awareness system BORIS

Oil response information system modules from accidental oil combatting point of view.



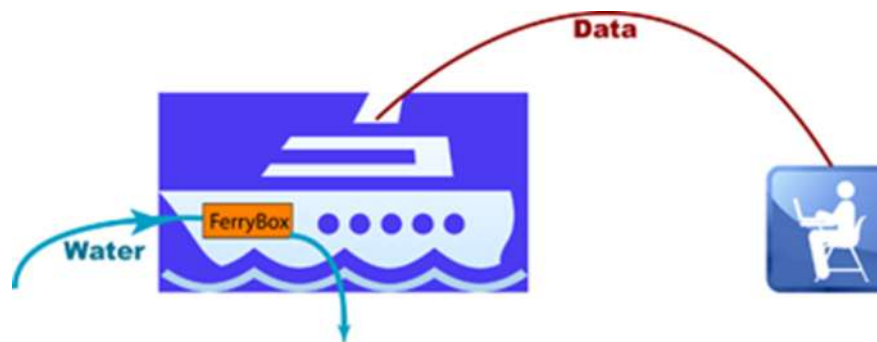
Proposed network of smart buoys along the Finnish coastline.



Datalogger, Battery
and Satellite modem
in watertight section

+ Oil
sensor

FerryBox ship routes in the Baltic Sea



End users and stakeholders

- Ministry of the Environment
- SYKE
- Finnish Boarder Guard (performs currently the aerial survey of illegal oil spills)
- Finnish Defense Forces, Navy
- Copenhagen agreement (collaboration forum of the oil pollution response authorities the Baltic Sea countries)
- Trafi - Finnish Transport Safety Agency- maritime sector
- HELCOM
- Neste Oil Oy
- Port of Helsinki
- Arctia Shipping Oy
- Wartsila Oy
- Other shipping companies including Arctic operators
- Insurance companies

AAWA

Advanced Autonomous Waterborne Applications

- Project budget approx. 6,5 M€, and mainly funded by industrial companies and Tekes Arctic Seas Programme
- Research partners are Tampere University of Technology, Aalto University, University of Turku, VTT and Åbo Akademi
- Industrial partners: Rolls-Royce, DNV GL, NAPA, Deltamarin and Inmarsat
- Project schedule 1.1.2015-30.6.2017



AAWA

Initiative develops future maritime solutions

- The aim of AAWA project is to make a world class initiative in the field of future advanced maritime operations.
 - The project develops both autonomous and remote operation for ship navigation, machinery and all onboard operating systems.
 - Safety, economical aspects and legislative restrictions are also taken into account.
-
- Info: markus.laurinen@koneteknologiakeskus.fi





ILMATIETEEN LAITOS
METEOROLOGISKA INSTITUTET
FINNISH METEOROLOGICAL INSTITUTE

Vessel Operations and Routing in Ice Conditions (VORIC) 2015-2016



FINNISH METEOROLOGICAL INSTITUTE



NLS
FINNISH GEOSPATIAL
RESEARCH INSTITUTE
FGI



Aalto University

Aker Arctic

ARCTIA  SHIPPING

Tekes



ATLAS ELEKTRONIK FINLAND
A company of the ATLAS ELEKTRONIK Group

 **Consilium**



ESL Shipping

ICEYE

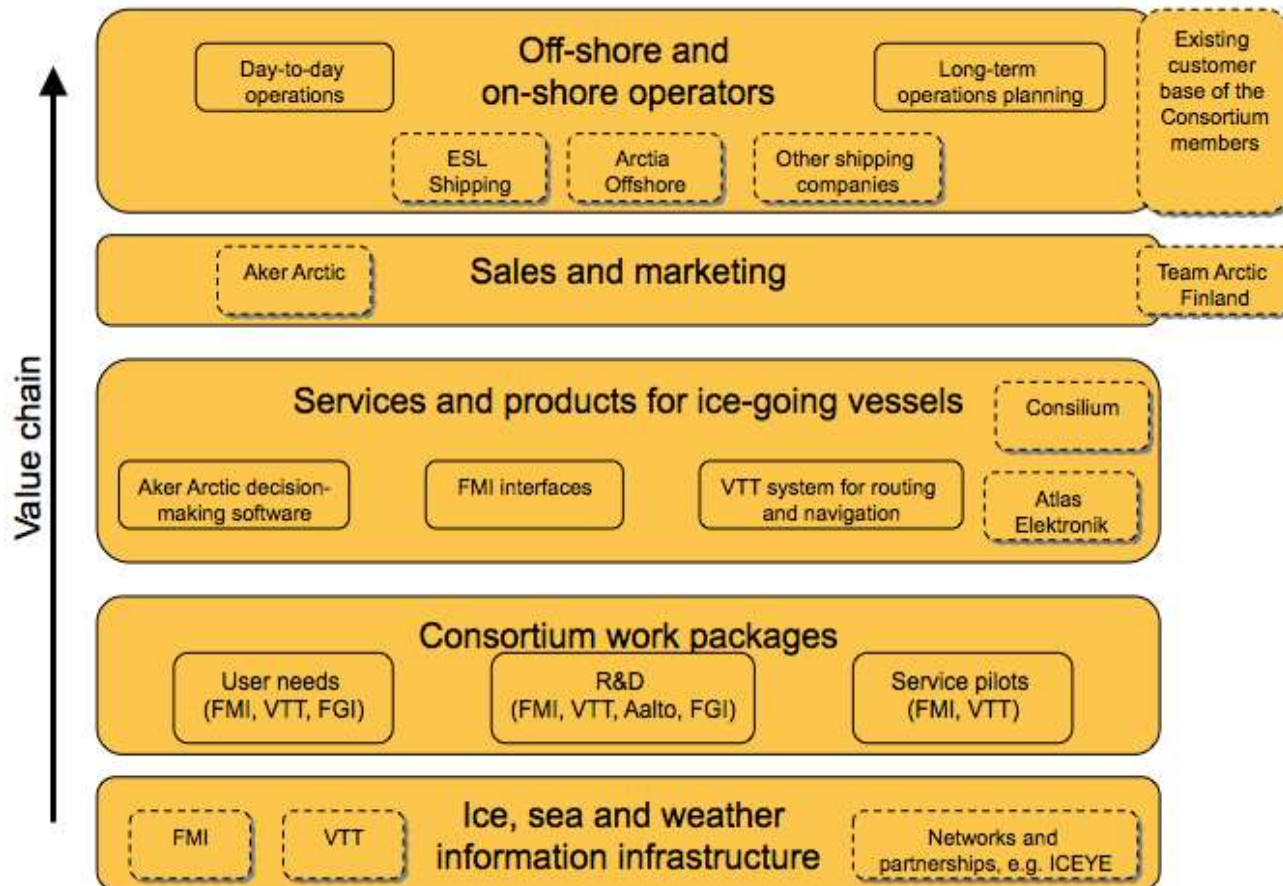


Central R&D deliverables

- Methodological development of services for shipping companies and marine industry for vessels operating in Arctic waters
- An improved performance model for ice-going ships using real-world data
 - Combination of ship performance in ice with condition info, vessel traffic and observed ship performance data
 - Numerical ice model data, satellite images, ice charting
- Ship specific ice resistance and risk map with novel **route optimization** methods and trial system
- Iceberg and pressure ridge detection methods from SAR images
- State-of-the-art ice, sea, and weather information flow, fusion and interfacing between organizations



Consortium roles

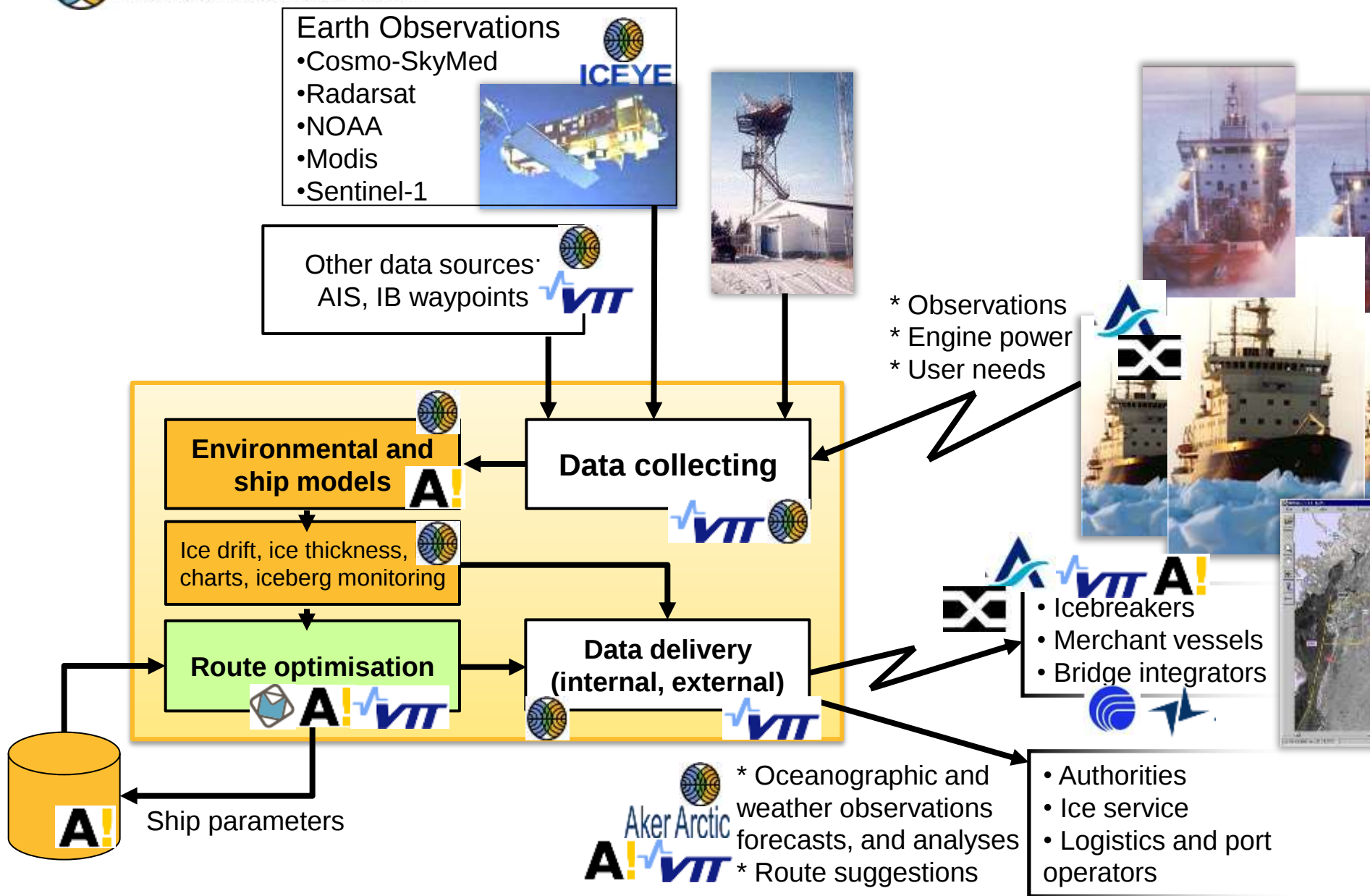


- Developments enhance human and environmental safety of highly sensitive Arctic areas
- Deliverables enable companies' future development in operations planning and day-to-day decision-making



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Scheme for ice navigation support system





SharperSat - Maintenance and recovery of high voltage electricity transport system

FS -> Demo



No single data gathering method can solve all the needs of end users. Therefore, the solution of power line inspection problems has to combine several complementary inspection methods to meet the needs of the customers in cost efficient manner.

- SatEO data is used to find potential issues near infrastructure assets
- When a potential issue is found, UAV inspection unit is sent to verify the issue in detail,
- Action plan (for field work) is created based on verified issues
- Services are divided into 4 categories based on the cost it causes to service provider.
- The SatEO is the only inspection method that does not require someone to visit the inspection site
- SatEO data reduces significantly the costs for the maintenance inspections.

Space Added Value

- Satellite Earth Observation
- Global Navigation Satellite System

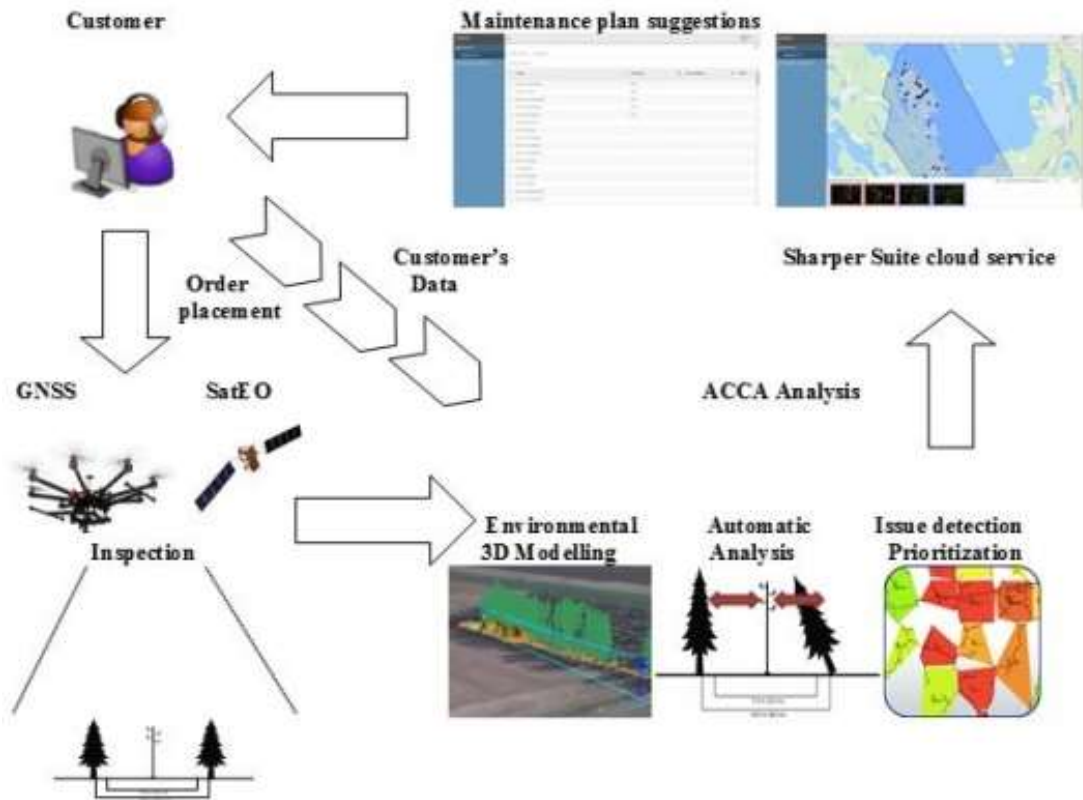
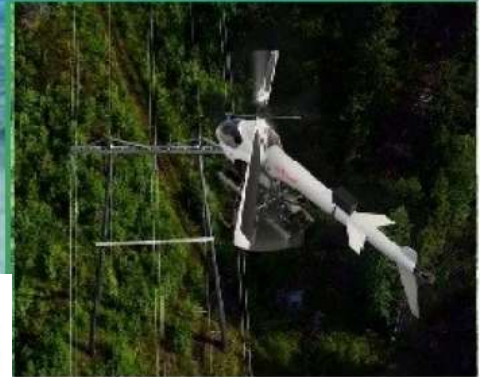


Sharper Shape Ltd

<http://www.sharpershape.com>

Finland

<https://artes-apps.esa.int/projects/sharpersat>



Future Marine Apps

Brainstorming event at FGI Finland, 10 March 2015

1. Generating the situational ice condition picture and transmitting it to different users (Craft - continental systems). Combining satellite data with the ice condition data mapped by vessel, and providing the ship with overall data. Furuno Finland.
2. Combining satellite-based oil spill detection with the OSD system. Furuno Finland.
3. Maritime surveillance system - combining satellite data in real-time. Furuno Finland.
4. Intelligent buoys - Envia / Meritaito
5. Underwater Laser - Envia / Meritaito
6. Underwater optical "satellites" - Envia / Meritaito
7. eNavigation - positioning in the high altitudes - FMI / Sarang
8. Scheduling system for icebreakers - FMI / Sarang



Thanks for your attention !



- APFinland – community portal <http://artes-apps.esa.int/community-portal/apfinland>
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-
- IAP Website: <http://artes-apps.esa.int/>