

EO-ALERT

Next Generation Satellite Processing Chain for Rapid Civil Alerts

Newsletter

December 2019 – Issue 2

EO-ALERT latest news

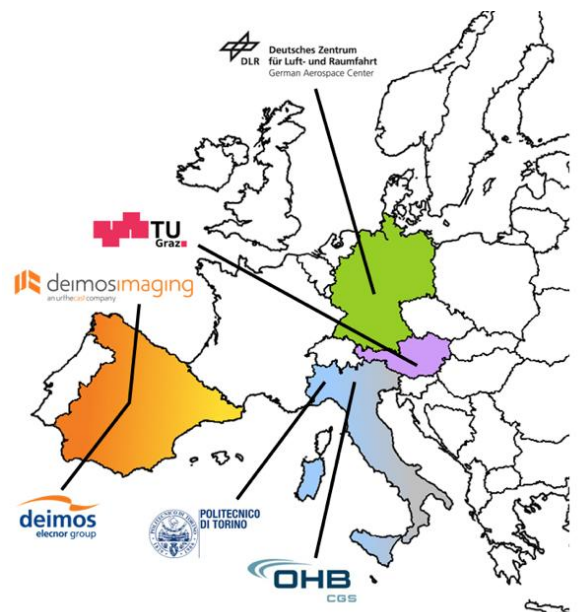
At the end of the second year of the project, the EO-ALERT team is progressing fast towards the consolidation of the individual technologies and their integration in the joint testbench. An overview of the last technological achievements has been presented at the recent EO-ALERT Technology Workshop in Madrid. The next developments will be presented at major venues and conferences in the fields of Earth observation, Space, and remote sensing.

EO-ALERT technological achievements

EO-ALERT considers two scenarios for verification and testing of the EO processing chain. For the ship scenario, Deimos recently demonstrated the viability of on-board optical image generation and ship detection/geolocation on a Xilinx Zynq Ultrascale+ hardware. Preliminary tests using the DEIMOS-2 payload show that the processing of a 100 km² area acquired with a 1-meter resolution can be completed within 30 seconds. On the same line, DLR implemented for the ship scenario SAR image generation for data acquired by TerraSAR-X satellite in Stripmap mode on the same hardware, demonstrating that an image of a 500 km² area can be generated in less than 70 seconds. A preliminary demo of the complete processing chain for the ship scenario, considering both optical and SAR sensors, was given during the recent EO-ALERT technology workshop showing latencies in the range of 1 minute to 5 minutes, globally, for the provision of the EO products to the end-user on ground. In the extreme weather scenario, current results predict an overall latency below 5 minutes considering optical data (MSG SEVIRI) for storm detection, whereas in the winds detection scenario it is estimated an overall latency of about 2 minutes when using SAR data.

EO-ALERT plans the experimental campaign

For the validation of the ship detection scenario, the EO-ALERT team is currently planning the deployment of two ships in the Mediterranean Sea between March and July 2020. Two acquisition campaigns lasting 4 days are foreseen, using a vessel of about 50 meters and a small dinghy of less than 10 meters. EO data



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will be acquired by Deimos-2 and TerraSAR-X satellites, while ground truth data will be provided by AIS and GPS on board the deployed ships. Stay tuned for the last news on EO-ALERT activities. *If entities external to the project are interested in this experimental demonstration campaign and the data acquired, please contact the project team.*

Report on the first EO-ALERT Technology Workshop

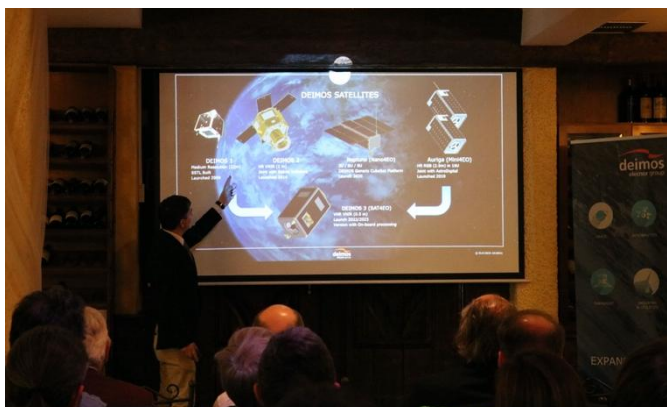
The EO-ALERT Technology Workshop has been held successfully at DEIMOS Space premises in Tres Cantos, Madrid on November 27, 2019. The main objective of the Workshop was to present the current status of the project and its future applications and discuss it with actors from different fields (Universities, National Agencies, International Agencies, Research and Development Centers, Industry). The aim of the Workshop was that of promoting dialogue and the exchange of ideas between Earth Observation service providers and end users, as well as among academics and industry professionals.



EO-ALERT workshop attendees

The Workshop featured five invited talks from EMSA (Mr Lourenço Pedro – Head of Sector – Earth Observation Services), NWCSAF/AEMET (Dr Calbet Xavier – Head of Department of Infrastructure and Systems), ESA PhiLab (Ms Regan Amanda – ESA InCubed Programme Manager), Addvalue (Mr Trachtman Eyal – VP Business Development), and ESA Optics (Mr Maresi Luca – Head of Optics Section), plus a technical session discussing all main achievements in the different technical areas of the EO-ALERT project.

EMSA depicted the recent evolution in Earth observation services, discussing current delivery times for the different classes of products. NWCSAF/AEMET discussed the use of Satellite Application Facilities for support to nowcasting, showing their importance and utility in meteorological applications. EO-ALERT can clearly provide an added value here, reducing the latency with which such products are delivered to the



DEIMOS Space CEO Ismael López welcomes the EO-ALERT workshop attendees and presents DEIMOS Space



EO-ALERT coordinator Dr. Murray Kerr introduces the workshop



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final user.

ESA PhiLab described its recent activities regarding industrial innovations in the EO field. The outcome is that there is an increasing need for solutions that extract wisdom from the huge amount of data provided by satellite missions and EO-ALERT can be instrumental in achieving that goal.

Addvalue presented its Inter-Satellite Data Relay System (iDRS), which enables real-time communication with LEO satellites and is an interesting option for deploying the EO-ALERT concept. ESA Optics presented the latest developments in innovative hyperspectral systems, highlighting how the current challenge is to directly provide to the final user the information in the data rather than the data itself. All contributions highlighted how the current trend in EO applications is a shift of paradigm towards solutions that can provide the final products to the user with the minimum possible latency.



Eyal Trachtman (VP Business Development at AddValue) presents "Inter-Satellite Data Relay System (iDRS): Connect with your LEO satellite constellation in real-time with iDRS"



Amanda Regan (Head of Phi-Lab Invest Office, Earth Observation Future Systems Department European Space Agency, ESA-ESRIN) presents "Overview of the Phi-Lab & Investing in Industrial Innovation (InCubed Programme)"



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Past Events

AGU Fall Meeting 2019

The AGU Fall Meeting is the largest international Earth and space science meeting in the world, which this year is held in San Francisco, CA, from 9 to 13 December 2019. Murray Kerr (Deimos), EO-ALERT coordinator, presented the project results on “Extreme Weather Convective Storm Nowcasting Via On-Board Satellite Processing” in the NASA session IN51B.



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Deimos's Team at IAC 2019



EO-ALERT flyer presented to the astronaut and Spanish Minister of Science Pedro Duque at IAC 2019

IAC 2019

The International Astronautical Congress (IAC) is the annual meeting of the International Astronautical Federation, which this year has been held at Washington, D.C., from 21 to 25 October 2019, to celebrate the 50th anniversary of a feat once thought impossible: humans walking on the moon. Otto Koudelka (TUGRAZ) was present for the EO-ALERT consortium, with the presentation “A High-Performance Low-Cost Communications System for LEO Satellites” in the Satellite Communications and Navigation symposium. Deimos Space prepared an EO-ALERT flyer that was distributed to the IAC audience.

ESA Phi-week 2019 in ESA-ESRIN

The European Space Agency (ESA) organized a Φ-week event in Frascati (Rome) from 9 to 13 September 2019, Italy, focusing on EO Open Science and FutureEO – to



Dr. Murray Kerr (Deimos) and Otto Koudelka (TU Graz) at UN Symposium

review the latest developments in Open Science trends and to explore how EO Open Science and innovation can benefit from the latest digital technologies, helping shape FutureEO missions and services. Murray Kerr (Deimos), EO-ALERT coordinator, presented the current status of the EO-ALERT project to multi-disciplinary communities.

United Nations/Austria Symposium: "Space: a Tool for Accessibility, Diplomacy and Cooperation"

The UN/Austria Symposium is one of the long-standing activities that are performed under the Programme of Space Applications of the United Nations Office for Outer Space Affairs. This year the symposium has been organized in Graz from 2 to 4 September 2019. Murray Kerr (Deimos), EO-ALERT coordinator, was invited there to present the innovations and paradigm changes offered by



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EO-ALERT, especially for developing nations. EO-ALERT enhances space accessibility, by answering to the end users the need of providing EO products with very low latency (enhanced-NRT) for increased throughput and proposing a cutting-edge solution. This also provides the flexibility of space service targeting to developing nations.

Partners



Supporting Organizations



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