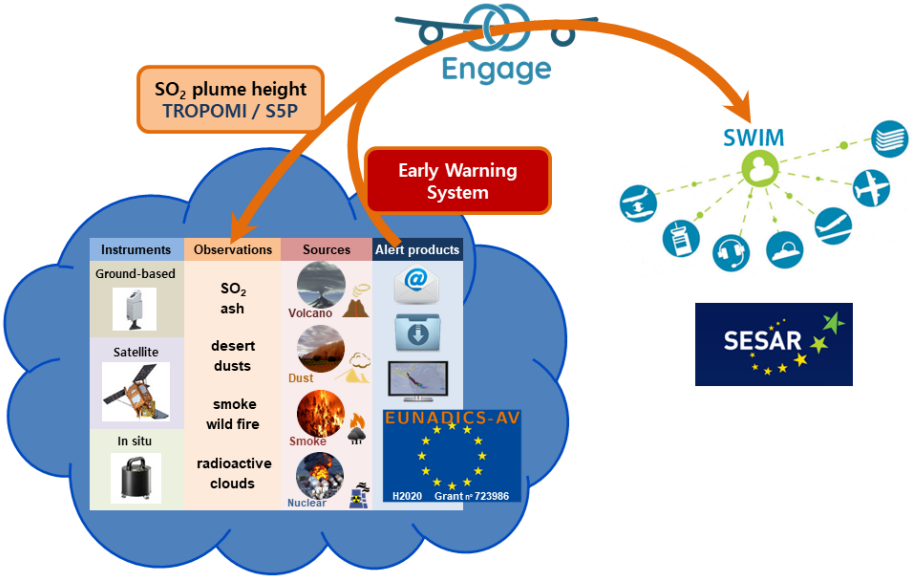
Operational alert Products for ATM via SWIM ('OPAS')

Summary

The main goal of the Engage KTN 'OPAS' project (Operational alert Products for ATM via SWIM) is to contribute a new product to an existing early warning system, so called SACS (Support to Aviation Control System). This system is dedicated to aviation and ATM, and has been recently upgraded in the frame of EUNADICS-AV project (Oct. 2016 - Sept. 2019). Alert products for four types of natural airborne hazards (volcanic eruptions, desert dust storms, wild fires and radioactive clouds) have been implemented, using three kinds of instrumentations (ground-based and satellite remote sensors, and in-situ instruments).

The new alert product targeted by OPAS project is the plume height of sulphur dioxide (SO_2) emitted during a volcanic eruption. SO_2 is a proxy for the volcanic ash height (which is notoriously difficult to measure). The instrument used to measure the SO_2 is TROPOMI on board Sentinel-5 Precursor.



The costs for the algorithmic development of such a product is covered by ESA, and the goal of OPAS is to implement in near real-time operational retrievals of SO_2 plume heights, also called layer height (SO_2 LH), and then to create alert products in standardised format, which can be used by ATM stakeholders. For this, the final goal is to transfer the SO_2 LH alert product into SESAR SWIM and its dedicated interface for ATM users. This will complement the transfer of EUNADICS-AV alert products, which has been initiated in the frame of EUNADICS-AV.

Thanks to contributions from an expert at Rolls-Royce and member of the ICAO MET-P group, we want to highlight the strong interest for aviation industry (from engine constructors to airlines) for getting information about the height of volcanic (SO_2) plume, as it is a problem for the engines (phenomenon known as hot corrosion) damages nickel super alloys of the airplane engines, bringing the possibility for single engine failures and consequent maintenance.

As BIRA-IASB is already involved in the development of future products related to airborne hazard for the existing (Sentinel -5 Precursor) and future ESA satellites sensors and platforms (like Sentinel 4 and 5), the project OPAS can be the starting point of future involvements of our early warning system with SESAR achievements.

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