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ALARM Project -multi-hazard monitoring and early warning system-

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We present the SESAR funded project ALARM. The overall objective of ALARM is to develop a prototype global multi-hazard monitoring and Early Warning System for different hazards affecting aviation. Continuous global Earth observations from satellite, ground-based systems, and atmospheric forecasts will be used to feed models capable of observing and predicting (nowcasting/forecasting) the displacement of particles in suspension and gas derived from natural hazards (volcanic ash and SO₂, dust clouds from sandstorms, and smoke from a forest fire); severe weather situations such as deep convection and extreme weather; exposure to increased levels of solar radiation during flight; and environmental hotspots potentially contributing to global warming in a large extent. Specifically, the aim is to enhance situational awareness of all stakeholders in case of multiple hazard crisis by facilitating the transfer of required relevant information to end-users, presenting such information in a user-friendly manner to ATM stakeholders. In summary, anticipating severe hazards and fostering better decision-making.

- ALARM will enhance an existing alert system -- with additional observations coming from geostationary satellites, improving the capabilities of observing natural hazards such as volcanic ash, SO₂ plumes, sandstorms, and forest fire.
- ALARM will tailor alert products (based on observations from satellites) of volcanic ash, SO₂ plumes, sandstorms, and forest fire to aviation stakeholders, including its severity, geographical location, and altitude.
- ALARM will develop nowcasting [up to 2 hours] and short-term forecasting [up to 6 hours] of SO₂ plumes at a regional scale.
- ALARM will develop nowcasting [up to 2 hours] and short-term forecasting [up to 6 hours] of severe thunderstorms at a local scale (airport).
- ALARM will develop short-term forecasting [up to 6 hours] and medium-term forecasting

[up to 48 hours] of climatic hotspots at a European scale.

- *ALARM will draft the requirements of all these alert products to be included in the SWIM Yellow profile.*