Operational evaluation of volcanic source terms (volcanic ash and SO2) from inverse modelling for aviation

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An operational framework is developed to provide timely and frequent source term updates for volcanic emissions (ash and SO2). The procedure includes running the Lagrangian particle dispersion model FLEXPART with an initial (a priori) source term, and combining the output with observations (from satellite, ground-based, etc. sources) to obtain an a posteriori source term. This work was part of the EUNADICS-AV (eunadics-av.eu), which is a continuation of the work developed in the VAST project (vast.nilu.no). The aim is to ensuring that at certain time intervals when new observational and meteorological data is available during an event, an updated source term is provided to analysis and forecasting groups. The system is tested with the Grimsvötn eruption of 2011. Based on a source term sensitivity test, one can find the optimum between a sufficiently detailed source term and computational resources. Because satellite and radar data from different sources is available at different times, the source term is generated with the data that is available the earliest after the eruption started and data that is available later is used for evaluation.