

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC1  
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## Comment on nhess-2021-105

Anonymous Referee #1

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Referee comment on "EUNADICS-AV early warning system dedicated to supporting aviation in the case of a crisis from natural airborne hazards and radionuclide clouds" by Hugues Brenot et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-105-RC1>, 2021

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### General comments

This study describes European Natural Airborne Disaster Information and Coordination System for Aviation (EUNADICS-AV) Early Warning System (EWS). The EUNADICS EWS greatly extends the existing Support to Aviation Control System (SACS) automatic alert system for airborne volcanic sulfur dioxide SO<sub>2</sub> and ash to include other airborne hazards (dust, smoke and radionuclide clouds) with creation of multiple new alert products (email and web pages with NRT maps, data files) and convenient formats (NetCDF). These new data are provided by EUNADICS partners and external data sources. The EUNADICS system further combines satellite data with the European ground-based networks (lidar and passive) and regional measurements from volcanic observatories in Iceland and Sicily.

EUNADICS serves European users, primarily Volcanic Ash Advisory Centers (VAACs) in London and Toulouse that have operational responsibility for volcanic ash advisories and forecasts. New message formats (NetCDF alert data products) will facilitate using the alerts to initialize plume dispersion models.

There is room for English and punctuation improvements, which would make paper easier to read. Many sentences need re-wording and/or clarification. Specific suggestions are mentioned below.

I found the paper informative and suitable for publication after language and syntax improvements.

### Specific comments

The aviation hazards satellite data sources are comprehensive, except for direct readout data for Iceland and Europe from Satellite Measurements from Polar Orbit (SAMPO) service (<https://sampo.fmi.fi/products>). Using SAMPO data would help reducing alert latency time and geographical coverage of the EUNADICS system.

Abbreviations should be explained when first used.

Consider removing abbreviation from the title.

## Technical corrections

Abstract is not clear to a general reader, not familiar with the EUNAUDICS project. I suggest explanation of the abbreviation "EUNADICS" in the abstract.

45 ATM – explain abbreviation

47 have shown significant

48 satellite[s]

51 e.g.[,]

55 service[s]

57 to proceed – consider changing this verb

58 ... highlighting the capability of operating early warnings ... - consider re-wording

75 implication in meteorological processing... – clarify

80 particles

81 satellite [data]

84 It makes it possible as it can to provide information

94 <https://meteoalarm.org>

149 The results - objectives?

153 Copernicus Atmosphere [Monitoring] Service (CAMS)

165-166 ... specialization [in] atmospheric transport modelling

Figure 1: SAMPO service

186 boards

195 i.e.,

207 were

217 possibility -> discussion with ?

218 Tables 1 and 2 -> 2 and 3?

227 overpass

243 particulate matter (PM)

243 volcanic ash total column [number or mass density]

245 averaging kernel

250 We reviewed ...

252 products

253 section 2.2?

276, 277 .. Observatory which operates ...

281 e.g.,

296 e.g.,

308 at NOAA

312 MWOs – explain abbreviation

316 aim at -> with the goal of supporting ...

317 satellites

345 use ground observations

404 when

405 up to the lower stratosphere – why not in the middle and upper stratosphere?

405 Eight? satellites sensors ...

407 Yang et al., [2007] - OMI product has been replaced with conceptually new OMI SO<sub>2</sub> product: Li et al., New-generation NASA Aura Ozone Monitoring Instrument (OMI) volcanic SO<sub>2</sub> dataset: Algorithm description, initial results, and continuation with the Suomi-NPP Ozone Mapping and Profiler Suite (OMPS), Atmos. Meas. Tech., 10, 445-458, doi:10.5194/amt-10-445-2017, 2017.

415 between 3 and 21 km, - why is the upper limit 21km?

421 e.g.,

423 expressed in Kelvin degree (K)

432 missing reference: Virtanen et al., (2014)

438 to define

443 illustrates

447 a fast? ash detection

448 i.e.,

469 presented

470 is based

487 is obtained ?

503 triggered

Figure 13, left map: should the white box show station Finokalia (Crete), shown on the right?

549 ash advections have not been observed

555 networks

560, 561,566: e.g.,

608 ZAMG and STUK – explain abbreviations

609 ZAMG

610 remove “have been designed”

613 delete “proceeding”. ... is implemented?

643 new alert products

644 creates

667-670 repeat of 645-650

683 quantity product – just use product

715 nuclear central - plant?

749 remove “thanks to”

751 explain TRL

753 i.e.,

757 allows consultation -> visualization?

763 burst -> cloud

801 remove “same”

814 consider

839 is operated -> is implemented ?

855 NCAP fiel -> file?

857 details

P36 868 possible

870 link not found

873 MWOs – explain

890-891 was designed with the goal of ...

891 passed

895 obtained -> has been demonstrated?

899 satellites

906 has developed

907 notifications

908 include

913 better spatial resolution – better than what?

916 Only one aspect

919 interest -> usefulness?

920 of using EUNADICS system in

921 activity about -> utility for ...

925,930 in the framework of ...

928 proceeding -> implementing

958 the alert

971 details

972 provided

991 e.g.,