

Report on «An EARLINET Early Warning System for atmospheric aerosol aviation hazards», Papagiannopoulos et al.,

Anonymous referee

General comment:

The paper authored by Papagiannopoulos et al. treats on methodology to detect airborne hazards for aviation in Near Real-Time (NRT). This methodology is mainly based on LiDAR network strategically deployed over the European region: EARLINET (European Aerosol LiDAR Network) network. The high resolution pre-processed data allows to obtain optical and microphysical parameters which could be helpful to develop the basis of a NRT Early Warning System (EWS) for aviation activity.

The aims of the paper are clearly written by the authors and focus on the natural hazards which impacted the aviation sector. As reported by the authors, the development of a NRT-EWS is a crucial point after the aviation crisis due the Eyjafjallajökull volcanic eruption in 2010. This paper is interesting about this point. The methodology described by the authors to develop a NRT-EWS from LiDAR observations are quite convincing. They evaluated this methodology by the analysis of two case studies. Nevertheless, the presentation of the results should be improved in order to help the reader to understand the conclusion of the study. The figures are fairly clear and helpful to support the key arguments provided in the paper. **I think that the manuscript may become acceptable after minor revisions.**

Major Concerns:

- 1) P8, line 10 to 18: The authors mentioned that the C_v term can be estimated using AERONET observations. Given as the mass-to-extinction conversion factor is not a product provided by AERONET, it will be helpful to give some explanation and references on the methodology to obtain this parameter.
- 2) P9-10: It is clearly mentioned by the authors that the purpose of the paper is not to analyze in details these dust and volcanic events. Nevertheless, the transport analysis of the aerosols plumes should be improved. At least, it appears crucial to describe and show clearly the region impacted by the aerosols plume.

Minors Concerns:

- 1) P3, line 11: “*Nowadays, more than 30 stations are active and perform measurements according to the network’s schedule (one daytime and two night-time measurements per week)*”. It could be interesting to include a map with localization of the sites involved in the network.
- 2) P3, line 22: “*To ensure homogeneous, traceable, and quality controlled analysis of raw lidar data across the network, a centralized and fully automated analysis tool, called the Single Calculus Chain (SCC), has been developed within EARLINET*”. Please, give references.

- 3) P10, line 10: "*Aerosol particles of possibly volcanic origin were monitored with the multi-wavelength lidar of NOA over Antikythera, Greece*". Please, give references
- 4) P28: The quality of the figure 7 should be improved.