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A European Network for Extreme Atmospheric Events Detection and Monitoring

Riccardo Biondi¹ and Stefano Corradini²

¹Università degli Studi di Padova, Dipartimento di Geoscienze, Padova, Italy (riccardo@biondiriccardo.it)

²Istituto Nazionale di Geofisica e Vulcanologia (INGV), Rome, Italy

Deep convective systems and explosive volcanic eruptions are destructive events causing deaths, injuries, damage to infrastructure. They account for the major economic damages in several countries, present several serious hazards to society, including impact to aviation safety and potential longer-term deleterious effects on weather and climate. The number and the intensity of severe convective events have increased in the last decades in some areas of the globe including Europe and it is going to further increase in a climate change environment. Relatively small eruptions could affect the economy of an entire continent as demonstrated in 2010 by the Eyjafjallajökull eruption. Due to the multi- and trans-disciplinary effects at local, regional and global scales, convective and volcanic clouds include impacts to several economic sectors such as telecommunications, transportation, health, insurances, agriculture, solar energy etc., raising the interest of diverse stakeholders and policymakers. However, the coordination between the different communities is still very difficult. On the one hand, measurement products lack harmonised quality indicators, data formats and measurement schedules. On the contrary, current attempts to transfer tailored products to end-users are not coordinated, and the same technological and social obstacles are tackled individually by different groups, a process that makes the use of data slow and expensive. The flow of information and knowledge between measurement, models, and society requires translation across disciplinary and cultural boundaries. The result is that current data-model-user cooperation becomes increasingly fractured and a potentially immense benefit for Europe's end users remains unexplored.

The overall objective of this action is to establish a network involving different communities interested on extreme atmospheric events, such as pilots, aircraft engines manufacturers, air traffic managers, modellers, aircraft companies, atmospheric physicists, meteorologists, policymakers and stakeholders. The network should coordinate the research activity for creating user-oriented operational and tailored products, understanding the needs of final users, to define a standard product format easily understandable by all the players, better coordinate the early warning activities, and establishing a new fast and efficient information transfer process within all the parties at international level. From scientific point of view, there is an urgent need to share ideas among scientists in nearby fields, to educate and train future researchers in the techniques and instruments for monitoring, detecting and modeling "extreme clouds", to develop new techniques and to integrate data coming from different systems. Extreme atmospheric events do

not have any border, thus the involvement of as many countries as possible would be beneficial for the action. The monitoring network of such kind of phenomena is not adequate in several countries due to different reasons such as unpopulated areas, political instability, and poverty. Conversely, availability of observational data from source regions is fundamental for monitoring and forecasting. Thus, the involvement and collaboration with near neighbour countries is very important. We have already established a good network with the aim of creating a future COST Action on this topic, with 23 countries and 35 different institutes involved but we are still missing collaborations from several eastern and southern European countries.