

Interactive comment on “Using the significant dust deposition event on the glaciers of Mt. Elbrus, Caucasus Mountains, Russia on 5 May 2009 to develop a method for dating and provenancing of desert dust events recorded in snow pack” by M. Shahgedanova et al.

Anonymous Referee #2

Received and published: 1 November 2012

This manuscript describes a major dust transport event between north Africa and the Caucasus Mountains in early May 2009. The manuscript gives a detailed analysis of the synoptic meteorology of the event, in which dust was entrained and transported during the passage of a low pressure system. A number of methods are used to track the progression of the dust plume, including LiDAR, trajectory modelling and satellite imagery. In addition, grain size and major and trace element chemistry are used to characterise the composition of the deposited dust, with the geochemical data also

C8870

used to assess its provenance region. The value of this manuscript is that it shows an example of dust transport along what may be an important, but little described dust plume pathway. In addition, it uses a variety of methods to track the transport of the dust plume, some of which offer great potential for monitoring dust transport. The authors imply this is a preliminary study with more work to be undertaken on this dust transport trajectory and I look forward to reading the findings of their future investigations.

The comparison of different remote sensing products is potentially the most useful component of this manuscript. While analysis of one event is not necessarily conclusive, it provides an important baseline from which further work can be undertaken.

I have reservations about the quality of the size and geochemical data. The size data was generated via SEM analysis with software used to determine the size of the dust. It is important to know how this data compare with more traditional forms of particle size analysis. There were seemingly no standards run alongside the geochemistry data, so the quality of these data cannot be assessed. There were also very few source samples analysed given that the meteorology suggest the dust may have been sourced from multiple regions. Presenting the data in table format is not particularly useful in this regard and a systematic and quantitative approach is required to provenance dust. I do note that the authors discuss limitations of their approach, however, to me, as it stands; these data are largely useful only as they describe the elemental composition of the dust. I am unaware of any successful dust provenance which has been undertaken using major elements.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 24437, 2012.