Review of the Technical Note entitled: Minerals in dust productive soils – impacts and global distribution by S. Nickovic et al.

This paper builds on previous work by Claquin et al. (1999) to establish a mineralogical database for soil dust that can be mobilized in the atmosphere. It has two main parts, one that details the impacts that dust has on respectively: solar radiation, cloud ice nucleation, ocean productivity and finally health; a second part that details how mineralogical information was used together with soil information to derive the database.
These two parts are not entirely connected but both interesting by themselves. Obviously the second part is the one that modellers will be most interested in to incorporate the detailed mineralogy that can then be used to study the aforementioned impacts. Hence it is most important to well document the assumptions that went into this part. In that sense the title of the paper does not entirely reflect its content and I propose that the authors change it to have the fact that they propose a soil mineralogical database appear.
Another suggestion is that the additions to the work of Claquin et al. (1999) should be clear in the presentation of Table 1. From this table, it should be clear which fractions come from this work and which part of the Table is original to the present study. That would help the reader follow better the information summarized in paragraph 3.2.
Several groups are working on extended database of the mineralogical composition of soils that can be windblown. For the purpose of knowing better how these datasets compare, it would have been interesting to have a global or regional mineralogical composition by masse of the dust contained in the soils.
To summarize my main comments, I deem that this work is very useful and will certainly interest mainly modelers and I encourage the authors to better delineate what is original to this work and what builds on the original Claquin et al. (1999).

Here are some minor points that will help improve the manuscript:

Page 1, line 17: change 'determent' to 'determinant'

Page 1, line 25: what you call 'global dataset' is only partial in coverage since the areas mapped are present dust emitting regions. Other regions, that were emitting in past climate are not necessarily covered. You should mention it here.

Page 2, line 8: change '1990-ties' to '1990s'

Page 2, line 10: change 'was significant improvement' to 'was a significant improvement'

Page 2, line 17-18: change 'Results of different regional models are compared for several days dust event in Bodélé depression region' to 'Results of different regional models are compared for a dust event lasting several days over the Bodélé depression region'

Page 2, line 18: change 'Similar study is performed over East Asia' to ' A similar

study was performed over East Asia'

Page 2, line 19: 'The degree of model uncertainty in dust emission is of order of magnitude…' to 'The degree of model uncertainty in dust emission is of an order of magnitude…'

Page 3, line 2: modify 'Going further on local scales complexity of sources increases.' to 'Going further to local scales, the complexity of sources increases.'

Page 3, line 25: you need a space just before '(FAO-UNESCO, 1974)'

Page 4, line 6-7: change 'We elaborate below several impacts of dust in which its mineral composition plays an important role.' To 'We elaborate below on several impacts of dust for which the mineral composition of dust plays an important role.'

Page 4, line 16: you could add Balkanski et al. (2007) as a reference

Page 4, lines 28-29: change 'In ice nucleation process, mineralogical structure of dust an plays important role. Clay minerals in dust are particularly efficient for ice nucleation processes shown in field and modelling studies' to 'In ice nucleation process, the mineralogical structure of dust plays an important role. Clay minerals in dust are particularly efficient for ice nucleation processes as shown in field and modelling studies'

Page 5, lines 18-19: change 'Mahowald et al. 2010 show that iron in to the ocean not only increase ocean productivity but that this increase represents carbon-dioxide sink, which has a global worming offsetting effect.' To 'Mahowald et al. (2010) show that iron into the ocean not only increase ocean productivity but that this increase represents a carbon-dioxide sink, which has a global warming offsetting effect.'

Page 5, line 21: change 'cruse' with 'cruise'

End of page 8/ beginning of page 9: It would be nice for the reader to have more information on how the following authors that you quote separated the clay and silt fraction:
'Clay and silt percentages in soil texture classes are specified following Tegen at al. (2002) and Shirazi et al. (2001).'

Page 11, line 15: replace 'Choice of dust mask is not considered here since it is out of the scope of our study.' with 'The choice of dust mask is not considered here since it is out of the scope of our study.'

Claquin, T., Schulz, M., and Balkanski, Y.: Modeling the mineralogy of atmospheric dust sources, *J. Geophys. Res.*, 104(D18), 22243-22256, 1999.

Balkanski, Y., Schulz, M., Claquin, T., and Guibert, S.: Reevaluation of mineral aerosol radiative forcings suggests a better agreement with satellite and AERONET data, *Atmos. Chem. Phys.*, 7, 81-95, 2007.