



Changing temporal patterns and intensity of Saharan dust events in (Central) Europe

György Varga (1) and Nadia Gammoudi (2)

(1) Research Centre for Astronomy and Earth Sciences (Hungarian Academy of Sciences), Sopron, Hungary (varga.gyorgy@csfk.mta.hu), (2) Department of Geology & Meteorology, University of Pécs, Ifjúság u. 6, H-7624 Pécs, Hungary

Previous long-term investigations revealed a clear seasonal pattern of Saharan dust events (SDEs) affecting Central Europe. Analysis of daily Aerosol Index data from 1979 to 2011 indicated spring- and summertime maxima of mineral dust episodes in the wider area of the Carpathian Basin. Characteristic synoptic meteorological background of SDEs were also identified, and three major types of atmospheric pressure patterns were distinguished. Several intense out-of-time SDEs with significant depositional events were recorded from the end of 2013. Intense washout events of North African mineral dust material were observed during these winter and early spring episodes. Synoptic analyses confirmed that majority of events were connected to very similar atmospheric patterns, generally an upper level atmospheric trough (the result of a remarkable meander of the jet stream) led to the development of a cut-off low over NE Africa, which deepened low pressure system transported large amounts of the mineral dust northward.

According to our suggestions, increased frequency of these intense, unusual dust events is connected to arctic amplification: the possible cause of development of more meandering jet stream (and wavy polar vortex) as a result of decreasing temperature difference of Arctic and lower latitudes driven by the faster warming high latitudes.

Support of the National Research, Development and Innovation Office NKFIH KH130337 is gratefully acknowledged.