FOUR YEARS LIDAR OBSERVATIONS AND MODEL SIMULATIONS FOR DESERT DUST INTRUTIONS OVER EASTERN MEDITERRANEAN

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ABSTRACT: Cyprus is located in Eastern Mediterranean and is strongly affected by North Africa and Middle East desert dust. From the four years (2010-2013) dataset, aerosol optical properties during the dust intrusions were measured by a polarization lidar (CUT-EARLINET station) and a 8 channels sun-photometer (CUT-TEPAK AERONET station) both located in Limassol, Cyprus. In total 32 Sahara and 17 Arabian dust cases were captured in the free troposphere over Cyprus. Backward trajectories calculated by the National Oceanic and Atmospheric Administration (NOAA) Hybrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) model at several altitudes, were used in order to identify the origin of the observed aerosol layers. The main objective of the current study is to evaluate the skills of the dust regional atmospheric model (BSC-DREAM8b) to forecast the dust vertical distribution in the Eastern Mediterranean basin from both deserts. For selected cases, dust extinction profiles retrieved from the combined analysis of the polarization lidar and sun-photometer observations were compared with the dust extinction profiles estimated by BSC-DREAM8b. This study highlights the importance of the synergistic use of passive and active remote sensing techniques in combination with the atmospheric models.