Geophysical Research Abstracts
Vol. 12, EGU2010-2544-1, 2010
EGU General Assembly 2010

Sea-salt aerosol forecasts: evaluation in the open sea

Pavel Kishcha (1), Slobodan Nickovic (2), Yehuda Agnon (3), and Pinhas Alpert (1)

(1) Tel Aviv University, Geophysics and Planetary Sciences, Tel Aviv, Israel (pavel@cyclone.tau.ac.il, 972-3 640-9282), (2) World Meteorological Organization, Geneva, Switzerland, (3) Technion, Haifa, Israel

Marine aerosols produced by sea-waves and associated winds are a potentially important climate forcing factor. Acting as efficient cloud condensation nuclei, marine sea-salt aerosols (SSA) could affect cloud formation and precipitation processes. In spite of the importance of impact of SSA variations on climate change, there are no regular sea-salt aerosol measurements in the open sea, where SSA are mainly produced and where their effects on climate are maximal. In order to partly fill the gap in our understanding of the SSA processes, model-based daily forecasts of three-dimensional distribution of SSA could be helpful, providing valuable information about space and time distribution of these types of aerosol. Model performance over the open sea has been verified in this study by comparing modeled SSA concentrations with observed wave height. Two sea-wave monitoring buoys, located in the Eastern Mediterranean near Haifa and Ashdod, provided us with information about wave height during the three-year period, from 2006 - 2008. In the winter months, when local sea-breezes were insignificant, the two buoys measured sea-waves created by synoptic-scale westerlies associated with the transit of cyclones across the Mediterranean: these conditions were similar to the conditions in the open sea. Numerical simulations of SSA were compared with observed wave height on a daily basis. The comparison showed that a high correlation between observed wind speed and wave height was accompanied by a high correlation between wave height and modeled SSA concentrations. This indicates that the model is capable of producing realistic variations of SSA concentrations over the open sea, in line with observed wind speed and wave height.