

SYNOPTIC-SCALE ATMOSPHERIC CIRCULATION AND HIGH OZONE CONCENTRATIONS OVER ISRAEL

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103 'High-ozone days', in which ozone concentrations exceeded 80 ppbv for at least 2 hours over broad geographical regions, were identified for the years 1997 to 2000. The days were classified into key synoptic- scale types prevailing over the eastern Mediterranean. Analyses of the temporal behavior of ozone mixing ratios during the high-ozone days show that the peak values are more frequent during the transitional (spring and autumn) seasons (65% of 103 days) than during the summer season (35%). These transition seasons episodes are associated with hot and dry air masses originating east of Israel, where ozone precursor emissions are negligible, indicating that high ozone levels are more dependent on air mass characteristics than on upwind precursor emissions. A comparison of the spatial distribution of background concentrations (defined as those measured at 0600 LST) for high-ozone days and for unstable winter days revealed little spatial variation for the winter cases, whereas a significant and consistent spatial variation existed for the high-ozone cases regardless of circulation type. This finding suggests that ozone background concentrations are more affected by seasonal variation than by spatial variation. In addition, distinctive patterns of diurnal variations were found to be related to synoptic-scale circulation type and geographical region.