



Monthly Cyclonicity Indices over Eastern Mediterranean Sea and their Precipitation Responses

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Output of the regional circulation model over Eastern Mediterranean Sea, centered in ca 33°N and 32°E point, yields Mediterranean Upper Cyclonicity Indices (MUCI), elaborated from monthly averages of 500hPa maps in 1948-2003 period prepared by CDC published by NOAA. MUCI defined as the impact of trough patterns over the areas (with about 260km radius from centered point). Criteria for obtaining the indices are curvature and gradient of the contours reflecting type and intensity of the circulations. 672 created samples of MUCI ranges from -2 to +2, indicating respectively the effects of ridge and trough lines over the area, estimated with less than 5% error because of ambiguity in assigning score as well as uncertainty. Results demonstrate trough pattern existence during all months of a year, weak in November (0.38) and high in June (0.93), describing dynamic activity of the cyclones in winter and thermal trough in summer. Higher trough effect has been observed in 1971-2000 with respect to 1951-80 periods indicating changes of synoptic climatology over the area. Precipitation responses in Nicosia and Tel Aviv (306mm and 519mm annually) are significant with correlation coefficients (R) of 0.27 and 0.29 respectively, tested at 5% level by ANOVA. Since Mediterranean trough plays an important role for climate conditions of the surrounding areas as well as Iran, therefore the effective area also valid for those localities where the climate tends to Mediterranean type such as Tabriz, Khoramabad and Shiraz (274mm, 516mm and 342mm annually) in Zagros range and precipitation responses are all significant (R are 0.17, 0.20 and 0.16 respectively). It is suggested to develop time series of MUCI from monthly to daily scales in order to obtain precise results and knowledge of weather type.