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Climatological Study of Mediterranean Cyclones Affecting South-East of Europe between 1980 and 2016

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The Mediterranean cyclones in their easterly movement often pass across Romanian territory and cause severe weather events like heavy precipitation and strong winds with disastrous effects on the socio-economic sectors. Moreover, once a certain cyclone reached the Black Sea Basin this one reactivates and moves on a retrograde pathway causing a prolonged period of severe weather. In this context, the aim of this study is to analyze the Mediterranean cyclones activity related to general circulation, with a focus on the cyclones that cross the Romanian territory. For study the reanalysis data, concerning Mean Sea Level Pressure (MSLP) and 500hPa geopotential height, were used from the European Centre for Medium Range Weather Forecast (ECMWF) ERA-Interim project. The statistical analysis in terms of occurrence frequency, trend and shifts (change points) of the Mediterranean cyclones for the period between 1980 and 2016 was made. In order to improve our knowledge of the large-scale mechanisms that favor the Mediterranean cyclones generation, the correlation coefficients between occurrence frequency of Mediterranean cyclones and North Atlantic Oscillation Index (NAOI) are calculated. Seasonal variability shows the intense cyclonic activity in winter and early spring. The results of the study are explained by the connection between the cyclonic activity and the sea level pressure and geopotential height fields patterns at regional and large scale.