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Investigation of the differences between deepening and intensification for 500-hpa cyclones in central and East Mediterranean region during warm season of the year

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Abstract. The maximum deepening rate per cyclone track is determined by the maximum height drop at the center of the cyclone (500-hPa low) on the basis of all the 6-h successive steps in its life cycle. The geopotential height gradient is calculated over the entire low area and the calculation continued with the variation of the gradient in the successive steps. The maximum intensification rate per cyclone is then determined as the maximum increase of the gradient in the life cycle. Maximum deepening rate for the 500-hPa cyclones in the area does not exceed, on average, 12 gpm/6 h. Maximum intensification which is 1.4 gpm/100 Km*6 h on average, occurs in the early stages of the cyclone's life cycle. This on the average happens approximately 9 h after the first time the low is detected. At the gulf of Genoa and the Adriatic Sea, cyclones usually show the maximum intensification after the maximum deepening. At Turkey's cyclogenesis area, however, this order is reversed. The spatial distributions of maximum intensification in the three sub-periods, indicate that it mainly occurs over Seas during late warm periods and over land during early and middle warm periods. Such a behavior underlines the role of low-level instability in cyclone development.

Full Article in PDF (PDF, 1897 KB)

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