



Islamic Azad University-Ahar Branch

Geographic Space

An Approved Scientific, Research-based Quarterly

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Detection and Investigation of Spatial-temporal Resolutions of Exotropical Cyclones

Date received: 7 December 2010

Date accepted: 22 June 2011

Abstract

In this research the detection, frequency and quality of behavior of extratropical cyclones in different seasons of year within 1995-1996 are studied. To reach such a goal, data of geopotential height with six-hour temporal resolution and spatial resolution (2.5. 2.5) for different levels (500, 600, 700, 850, 925, 1000) were extracted from atmospheric databases and used (NCEP/NCER). Cyclones were identified by which two requirements were considered including 1- the places whose geopotential height is minimum in relation to the eight neighboring places, 2- regional geopotential height gradient in nine points present in at least 100m/1000km. The results show that in all levels, cyclones in winter and autumn have the highest frequency with very little difference. Frequency distribution in winter is more unified than other seasons and cyclonic areas intend to lower latitudes. One of the most evident features of this season is the presence of cyclonic areas in Mediterranean region. Spring is in the third level due to its cyclonic frequency. From frequency perspective summer cyclones have the least amount with the highest difference. Gang cyclone as the most evident features of other cyclones in 1000 and 925 HP levels are seen in spring and summer. Summer rainfalls and 120-day winds of Sistan in the southeast of Iran are related to the formation of such a system.

Keywords: Cyclone, Geopotential height, Geopotential height gradient, Spatial-temporal distribution.

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