

Laboratory of Synoptic Meteorology

Surface and level map analysis pressure in the upper atmosphere

(First Semester)

ASD / 2nd Stage

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LAB (7)

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Pressure level map analysis 300hpa

drawing of isotach

The purpose of the experiment: Analyzing the pressure level map of 300 hPa by drawing isoheight lines and determining the jet stream by drawing isotach lines.

The theoretical part :This level is often located near the real jet stream axis and the tropopause level, so it is of special importance for airlines to avoid the path of this stream. Also, the analysis of this type of map adds knowledge about the vertical structure of the atmosphere. In any case, its average rise is between 8660 gpm and 9775 gpm over the course of one year, with a climatic average of about 9000 gpm.

The practical part:

- 1- The pressure level is 300hPa at a height of 9168m.
- 2- The lines of isoheight of the stations pass at intervals of 120m or 60m between one line of the map.
- 3- Lines equal to the wind speed isotach are drawn starting from the highest wind speed of the pressure level 300hPa in the form of continuous oval lines with a period of 10 kt between one line and another according to the wind speed on the stations. As the values of the line increase as we go to the center where the wind is greatest, it is known as the jet stream.
- 4- We determine the area of the maximum wind, which represents the speed of the highest wind and is located in the center and is known as the path of the jet stream, then passes an arrow in red color parallel to the direction of the greatest wind passing from its center, on which is written the amount of speed and the unit measured by it on the same lines.

The jet stream: It is a narrow belt of high speed winds, several thousand kilometers in length and hundreds of kilometers in width, but its thickness does not exceed a kilometer. These ripples represent disturbances in the western waves accompanied by depressions and air heights extending to the surface of the earth. The importance of the jet stream is that it helps to predict the development of systems on the surface, forecast rain and determine the regions of the upper fronts.

There are two types of jet streams:

1-Polar Jet (PJ):

The polar jet stream represents the main source of energy for the weather, and in order for the jet stream to be generated, there must be two adjacent polar and orbital air masses. It is known as self-development and may result in violent weather conditions.

2-subtropical jet stream(STJ):

It plays a major role in moving tropical air northward during the winter months, which enhances the mid-latitudes systems.

Discussion:

- 1- We compare the 300hPa level map with the surface map and compare the location of the jet stream from the pressure system on the surface to what it will lead to.
- 2- Select areas with higher wind speed values. What do you expect to be found in these areas?
- 3- What is the jet stream explained that? Then talk about its types.