WATER VAPOR PRESSURE AND SATURATION DEFICIT IN HUEDIN DEPRESSION

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Abstract

Two of the most important values of the relative humidity (water vapor pressure and saturation deficit) are listed below using data recorded at the meteorological station from Huedin during 1970 – 2008. The values of these quatities vary by convective and advective motions, turbulent movements and phase changes of wather.

The amount of water vapor depends on the origin of air masses, physical- geographic conditions, soil surface condition, precipitation, etc. The highest quantities of water vapor from the sample area come from the Atlantic Ocean and Mediterranean Sea. In smaller proportion at the increase humidity of air contribute water evaporation from the soil, rivers surfaces,lakes, wet surfaces and from the plant transpiration.

Key words: water vapor pressure, saturation deficit.

INTRODUCTION

Water vapor voltage or vapor pressure (e) represent the partial pressure of water vapor in air space. Also called elastic force of steam and is expressed in millibars (mb) or millimeters of mercury (mmHg). Saturation voltage or maximum voltage (E) is the maximum potential pressure of water vapor in a volume of air, which is reached when the volume of air that is saturated with water vapor. Both saturation voltage and real voltage are related to the air temperature variations, so the maximum voltage increases with temperature and the actual voltage decreases with increasing air temperature. Water vapor pressure also depends on the state of aggregation of water, the shape of the evaporation surface, wind and atmospheric pressure.

Saturation deficit is the difference between the maximum absolute humidity (A) and absolute humidity at a given time (a) or the difference between the maximum voltage (E) water vapor and efective voltage (e) (actual)at a certain temperature and pressure. Saturation deficit is expressed in mmHg or mb. It is influenced by: temperature, precipitation, evaporation, evapotranspiration, condensation, the underlying surface.

MATERIAL AND METHODS

To emphasize the water vapor pressure and saturation deficit from Huedin Depression (560 m),we used data from the period 1970 to 2008 obtained from the instrumental observation made at the meteorological station Huedin instrumental.

Using climatological research methods and specific means pursued a more accurate processing of all data we had available.

The comparative method highlights the differences of this element from the period analyzed by comparison of the climatic elements.

Using statistical- mathematical methods were processed data from the A.N.M Archive. The results obtained by mathematical and statistical methods were then transposed graph to clearly show the temporal variability of climatic elements.

RESULTS AND DISCUSSION

1. Water vapor pressure

Monthly and annual regime of water vapor pressure

Water vapor pressure values vary inversely with altitude, the annual average in Huedin Depression is 9.2 mb (see table 1).

Table 1

Monthly and annual values of water vapor pressure (mb) in Huedin, during 1970 – 2008

Month	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
Average	4.3	4.6	5.9	7.8	11.2	13.8	15.1	14.9	12.1	8.9	6.3	4.9	9.2

Source: data processed after A.N.M Archive

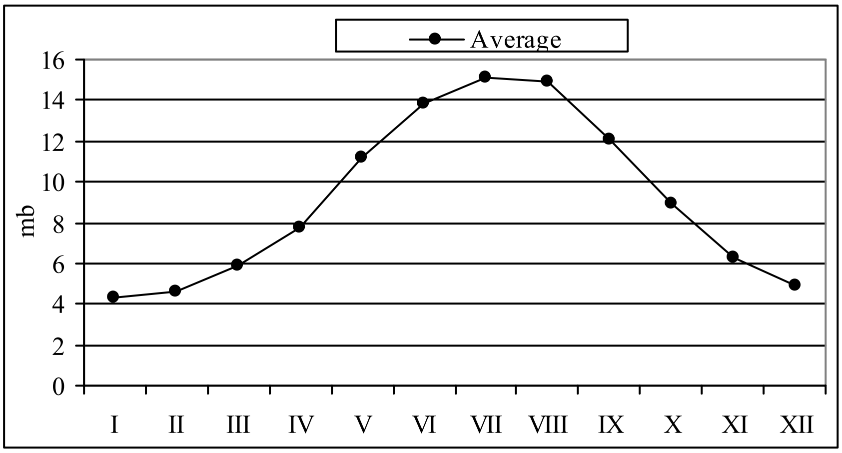

Figure 1 Annual evolution of water vapor pressure at Huedin during 1970-2008

During the year, the monthly average values of water vapor pressure increases with increasing temperature and increased wind which speeds evaporation. The highest values of water vapor pressure of the sample area occurs in July, 15.1 mb. The lowest values are generally in January, about 4 mb (see figure 1).

2. Saturation deficit

Monthly and annual conditions of saturation deficit

In the depression Huedin area, the yearly averages of the saturation deficit records 3.5 mb (see table 2).

Table 2

Monthly and annual values of saturation deficit (mb) in Huedin, during 1970 – 2008

Month	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
Average	0.8	1.2	2.4	3.8	5.2	5.8	6.8	6.6	4.2	2.7	1.3	0.8	3.5

Source: data processed after A.N.M Archive

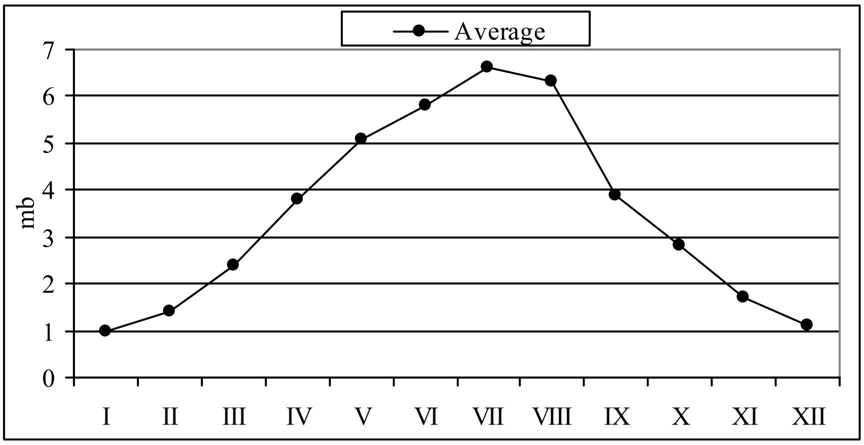

Figure 2 Annual evolution of saturation deficit at Huedin during 1970-2008

Saturation deficit during the course of a year, rising from January to July, after which the values start to decline. Thus, the monthly average of saturation deficit during the year are higher in the summer months, in July records the maximum value, 6.8 mb and 6.6 mb in August (see figure 2).

Lowest values are recorded in winter so in January and December recorded 0.8 mb.

CONCLUSIONS

Atmospheric humidity values in the area of Huedin depression are affected by Atlantic Ocean and Mediterranean Sea.

During the year, the monthly average of water vapor pressure increases with increasing temperature and increased wind which speeds evaporation.The highest values of water vapor pressure of the sample area occurs in July, 15.1 mb, the lowest values are in January, about 4 mb. The annual average is 9.2 mb.

In the depression Huedin area, the yearly averages of the saturation deficit records 3.5 mb. Saturation deficit during the course of a year, is rising from January to July, after which the values start to decline. Thus, the maxmimum value was recorded in July, 6.8 mb.

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