

POSTER: Clouds, Chemistry, Aerosol and Radiation

Poster 23: FEATURES OF CLOUDINESS INTRA - ANNUAL DISTRIBUTION IN LORI REGION OF THE REPUBLIC OF ARMENIA

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Features of daily and annual distribution of low and total cloudiness (expressed in points) and number of cloudy days are discussed and analyzed in the work, are clarified cloud repeatability status and the main types of cloud repeatability status and the main types of cloud in Lori region of the Republic of Armenia. For solving of these problems as a theoretical and informational basis are relevant studies. As a starting material used actual data of cloudiness observations of meteorological stations of Armstatehydromet of MES of RA. As a methodological basis used general scientific, geographical, characteristic, statistical analysis, confrontation, comparison, analysis methods.

The cloudiness, like other meteorological elements, are characterized with daily and annual cause and uneven spatial distribution. Study area in the republic stands by high repeatability of cloudy sky condition (the number of cloudy days by total and low cloudiness during the year accordingly are 77-164 and 44-85 days). One of the features of cloudiness of the region is, that here there is not high fluctuations of the number of cloudiness during the pass from one month to other. For example, at Bagratashen meteorological station average monthly values of the number of low and total cloudiness are accordingly 2.0-3.8 and 4.8-6.4 points.

Clear that minimum repeatability of cloudy condition of sky (8-10 points) observes in December-January during the year, from February observes increase, which approaches to maximum in March-April, exception is Tashir, where it observes in May. From May observes some decrease of cloudiness. Secondary minimum of repeatability of cloudy condition observes in August-September, after that again observes increase. Secondary maximum observes in October-November. From November the cloudiness is decrease. Such annual cause is characterize also to total cloudiness (point). But in low cloudiness annual cause (point) observes one maximum (April-May) and one minimum (December-January) values mainly.

Both for total and low-cloudiness summer months are characterized with high repeatability of semi-cloudy condition of sky (3-7 points) because of vertical development of cloudiness. By low cloudiness repeatability of semi-cloudy condition of sky is less than repeatability of clear (0-2 points) and cloudiness (8-10 points) condition of sky. In the republic by total cloudiness smallest repeatability of semi-cloudy condition of sky (15-18 %) observes in study area.

We discussed repeatability conditions of clear (0-2 points), semi-cloudy (3-7 points) and cloudy (8-10 points) of sky (%) for January, April, July and October and for different times of the day. Became clear, that during the cold period of the year maximum cloudiness during the day observes in the early morning, minimum - in the afternoon, and in the warm period of the year maximum cloudiness observes in the afternoon, minimum-in the morning.

Studies show, that maximum value of total cloudiness in all periods of observations observes in March-April, minimum - in August-September. In study area mainly are prevailed cirrus, altocumulus, stratocumulus, cumulonimbus clouds. And altocumulus and stratocumulus clouds more often are in July, cirrus in April-May, cumulonimbus - in May-June. Generally, during the cold period are prevailed stratus and in spring and summer months - cumulus.

For some meteorological stations and for different months have been calculated stability coefficient of cloudiness.

Become clear, that in Lori region more stable cloud weather (stability coefficient of cloudiness is 50-70 %) observes in spring and autumn months.

Thus,

- Cloudiness stands out both of daily and annual cause;
- Maximum repeatability cloudy sky condition mainly observes in March-April and the minimum - in December-January;
- The region is characterized by small fluctuations between periods of cloudiness;
- In the cold season the maximum cloudiness observes early in the morning and during the warm period - in the afternoon, when the intensity of convective flows is increased;
- Maximum sustainable cloudy weather is observed in spring (50-70 %) and autumn (50-65 %) months;
- The link between clouds repeatability and absolute height of area is almost absent.

Poster 25: Modeling of foehn-induced extreme local dust pollution in the Dead Sea valley

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A foehn phenomenon and foehn-induced effects on extreme local dust pollution were analyzed over the Judean Mountains (1000 m) and over the Dead Sea valley (-420 m), using high-resolution COSMO-ART model simulations. The model data were supplemented with in situ meteorological measurements from a chain of stations located across the mountain ridge. Hot foehn winds created a pronounced temperature inversion over the western part of the valley. Strong foehn winds activated local dust sources, while the foehn-induced pronounced temperature inversion trapped dust particles beneath the inversion. These trapped local dust particles contributed to maximum surface dust concentration but not to dust aerosol optical depth (AOD) in the western Dead Sea valley. By contrast, in the central and eastern Dead Sea valley, in the absence of temperature inversion, the ascending airflow lifted dust particles up to 2-km altitude, contributing to the maximum local dust AOD. Thus, it was because of the temperature inversion in the western Dead Sea valley that the maximum surface dust concentration did not coincide with the maximum AOD: this being one of the specific effects of the foehn phenomenon on local dust pollution in the Dead Sea valley.