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Monthly and Ten-Day Average Values of Freezing Level in the Atmosphere Above Kakheti Territory (Georgia) from April to October

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ABSTRACT

Results of the analysis of the data about height of zero isotherm in the atmosphere above the territory of Kakheti (Telavi) from April through October 2012-2016 are presented. At present in Georgia the aerological sounding of the atmosphere is not conducted. Therefore, in the work the resources of the worldwide network aerological observation http://ready.arl.noaa.gov/READYcmet.php are used, according to which data the extrapolation of the vertical distribution of meteorological elements for any location of world is possible. In particular, the repetition of height of zero isotherm according to daily data for 04, 10, 16 and 22 hours on the Tbilisi time for each month is studied; it is obtained that monthly average values of the zero isotherm change from 2603 m during April to 4439 m during August, and ten-day average - from 2415 m in the first decade of April to 4615 m in the second decade of August.

Key Words: aerological sounding of the atmosphere, freezing level.

Introduction

The thickness of the supercooled part of the convective clouds is one of the most important conditions for formation and development of hail processes in them. Besides this, the data about the levels of negative temperatures in the clouds are necessary for the meteorological forecast of showers, thunderstorms and hail, determination of different characteristics of convective clouds from the data of radar measurements, optimum zones of sowing in them by the ice-forming reagent with the operations on the active actions for the purpose of the interruption of hail, the regulation of precipitations, etc. [1-4].

In the past century in the Soviet period of time the aerological sounding of the atmosphere in Tbilisi, Sukhumi, Batumi [5-7], and in the years of the work of anti-hail service in Kakheti in the village of Ruispiri of the Telavi municipality was carried out [8-11]. The aerological sounding of the atmosphere is not conducted after 1991 in Georgia.

At present, in connection with the restoration of anti-hail works in Kakheti [12-15], arose the need of obtaining the operational information about the vertical distribution of the meteorological parameters in this region of the Georgia, which was necessary both for conducting active actions to the hail-dangerous and hail clouds [4,15] and for operational provisions of contemporary radar on recording of the parameters of hail clouds (probability of hailstorm, the size of hail, etc.) [16-21]. For obtaining this information the resources of service of the worldwide network of the aerological observations of http://ready.arl.noaa.gov/READYcmet.php are used, according to data of which is possible the extrapolation of the vertical distribution of meteorological elements for by any point of world.

It should be noted that the indicated resource has 10-years data file. Therefore, besides the use of operational information, is a possibility of studying the influence of climate variation in Georgia [22-25] on a variation in the vertical profiles of a meteorological element in free-air conditions at present. Similar works in Georgia are begun in 2015 year [26,27]. Let us note also, that the operational and averaged long-term data about

the level of the zero isotherm, it is planned to use for evaluating the sizes of hail stones on the earth's surface taking into account their sizes in the clouds according to the data of radar measurements and the height of locality with the use of known methodology [1-3, 28-31]. This will make it possible to build the detailed operational and model maps of the distribution of potential damage from the hail of agricultural crops, to conduct the estimation of the physical effectiveness of action on the hail processes, to improve the procedure of anti-hail works and so forth [4,32].

This work is the continuation of the studies [26,27,33] initiated. Below some results of the analysis of the statistical structure of height of zero isotherm in the atmosphere above the territory of Kakheti from April through October 2012-2016 are represented. The selection of the indicated season of year is caused by the need of using the results of a study in the work of anti-hail service in Kakheti.

Material and methods

For investigating the thermal regime in the free atmosphere above the territory of Kakheti as in [26,27,33] the resources of http://ready.arl.noaa.gov/READYcmet.php were used.

Height of zero isotherm H(0°C) was determined from the formula:

$$H(0°C)=(T1 \cdot H2-T2 \cdot H1)/(T1-T2)$$

where, T1 and T2 are the temperature of air at the levels H1 and H2 respectively. With this T1 must be > 0°C, and T2 < 0°C.

In the work the statistical analysis of hourly (04, 10, 16 and 22 hours on the Tbilisi time) heights of zero isotherm from April through October 2012-2016 is carried out. The total quantity of data composes 4280. As the informational unit the values of height of zero isotherm, average in the twenty-four hours are used, averaged in five years.

The analysis of data with the use of the standard statistical analysis methods is carried out [34]. The following designations will be used below: Min – minimal values, Max - maximal values, Range - variational scope, St Dev - standard deviation, σ_m – standard error, Cv (%) - coefficient of variation, 95%(+/-) - 95% of confidence interval.

The statistical data about the decade average and monthly average values of the height of zero isotherm above the investigated region are represented below.

Results and discussion

Results in Fig. 1-2 and Table 1-4 are represented.

Fig. 1 presents the data about the repetition of heights of zero isotherm for the separate months of the season of anti-hail works. As follows from this figure the greatest repetition of the hour values of the level of the zero isotherm it falls to the following altitude ranges - April: >2.6-3.0 km (26.3 % of the cases), May: >3.0-3.4 km (33.7 % of the cases), June: >3.8-4.2 km (38.3 % of the cases), July: >4.2-4.6 km (38.1 % of the cases), August: >4.6-5.0 km (38.5 % of the cases), September: >3.8-4.2 km (33.3 % of the cases), October: >2.6-3.0 km (18.1 % of the cases).

Tables 1-4 statistical characteristics of the average monthly and decade (ten-day) average values of heights of zero isotherm (m) above the territory of Kakheti from April through October depict.

April (Table 1). Average monthly value of H(0°C) = 2603 m, the range of change: 1902 - 3215 m.
1 ten-day periods. Average monthly value of H(0°C) = 2415 m, the range of change: 1902 - 2989 m.
2 ten-day periods. Average monthly value of H(0°C) = 2627 m, the range of change: 2487 - 2893 m.
3 ten-day periods. Average monthly value of H(0°C) = 2767 m, the range of change: 2251 - 3215 m.

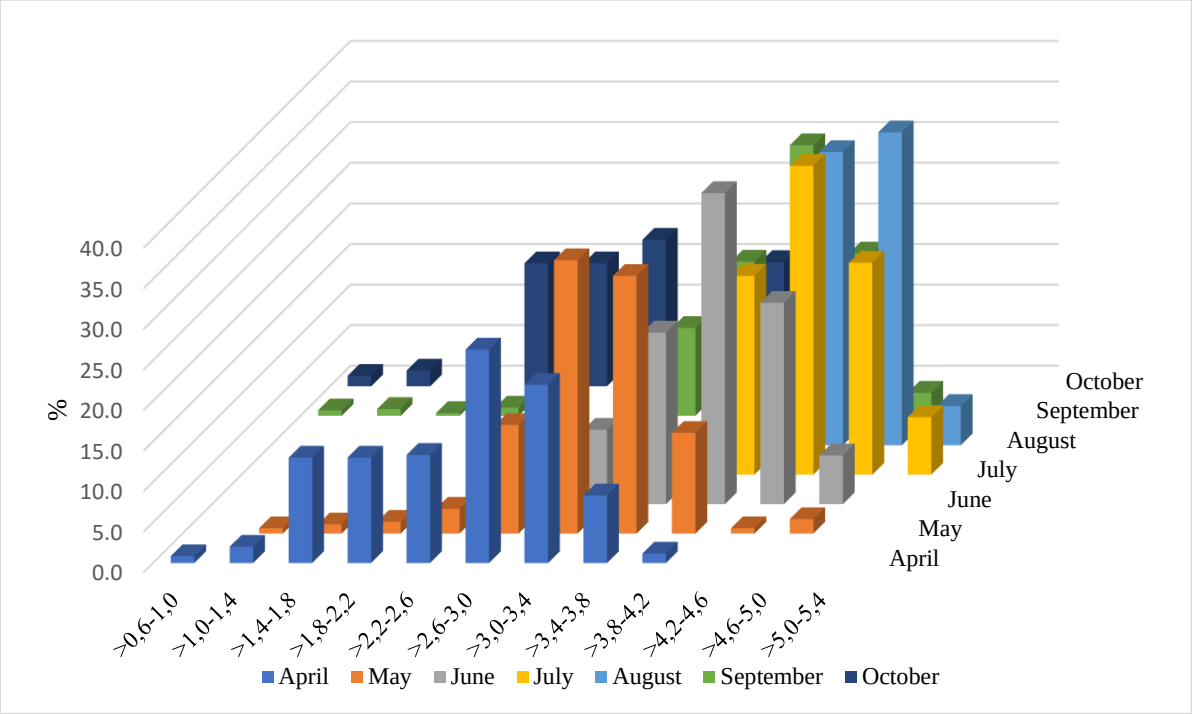

Fig. 1. Repetition of height of zero isotherm (km) above the territory of Kakheti in April- October of 2012-2016 according to the data for 04, 10, 16 and 22 hours on the Tbilisi time.

Table 1

Statistical characteristics of the average monthly and decade average values of heights of zero isotherm (m) above the territory of Kakheti during April and May

Month	April				May			
Parameter	Month	1 Decade	2 Decade	3 Decade	Month	1 Decade	2 Decade	3 Decade
Mean	2603	2415	2627	2767	3340	3260	3205	3534
Min	1902	1902	2487	2251	2976	2976	3018	3110
Max	3215	2989	2893	3215	3762	3555	3351	3762
Range	1313	1086	407	964	786	579	333	651
Median	2608	2344	2573	2812	3313	3219	3249	3570
St Dev	347	409	131	366	220	200	130	167
σ_m	64	136	44	122	40	67	43	53
Cv (%)	13.3	16.9	5.0	13.2	6.6	6.1	4.0	4.7
95%(+/-)	126	267	86	239	79	131	85	103

May (Table 1). Average monthly value of H(0°C) = 3340 m, the range of change: 2976 – 3762 m.
1 ten-day periods. Average monthly value of H(0°C) = 3260 m, the range of change: 2976 – 3555 m.
2 ten-day periods. Average monthly value of H(0°C) = 3205 m, the range of change: 3018 – 3351 m.
3 ten-day periods. Average monthly value of H(0°C) = 3534 m, the range of change: 3110 – 3762 m.

Table 2

Statistical characteristics of the average monthly and decade average values of heights of zero isotherm (m) above the territory of Kakheti during June and July

Month	June				July			
Parameter	Month	1 Decade	2 Decade	3 Decade	Month	1 Decade	2 Decade	3 Decade
Mean	3978	3763	3990	4181	4432	4330	4524	4442
Min	3642	3642	3736	4020	4231	4248	4331	4231
Max	4294	3878	4294	4290	4658	4408	4658	4614
Range	652	237	558	271	427	160	327	383
Median	3985	3767	3985	4192	4397	4323	4553	4431
St Dev	212	75	183	91	133	51	129	128
σ_m	39	25	61	30	24	17	43	41
Cv (%)	5.3	2.0	4.6	2.2	3.0	1.2	2.9	2.9
95%(+/-)	77	49	120	60	48	34	85	80

June (Table 2). Average monthly value of H(0°C) = 3978 m, the range of change: 3642 – 4294 m.
1 ten-day periods. Average monthly value of H(0°C) = 3763 m, the range of change: 3642 - 3878 m.
2 ten-day periods. Average monthly value of H(0°C) = 3990 m, the range of change: 3736 - 4294 m.
3 ten-day periods. Average monthly value of H(0°C) = 4181 m, the range of change: 4020 – 4290 m.

July (Table 2). Average monthly value of H(0°C) = 4432 m, the range of change: 4231 - 4658 m.
1 ten-day periods. Average monthly value of H(0°C) = 4330 m, the range of change: 4248 – 4408 m.
2 ten-day periods. Average monthly value of H(0°C) = 4524 m, the range of change: 4331 – 4658 m.
3 ten-day periods. Average monthly value of H(0°C) = 4442 m, the range of change: 4231 - 4614 m.

Table 3

Statistical characteristics of the average monthly and decade average values of heights of zero isotherm (m) above the territory of Kakheti during August and September

Month	August				September			
Parameter	Month	1 Decade	2 Decade	3 Decade	Month	1 Decade	2 Decade	3 Decade
Mean	4439	4505	4615	4220	3721	3764	3946	3452
Min	3974	4385	4477	3974	3103	3591	3756	3103
Max	4763	4574	4763	4456	4100	3984	4100	4008
Range	788	189	286	482	997	392	344	904
Median	4494	4526	4616	4174	3818	3817	3929	3362
St Dev	209	62	98	176	282	142	116	291
σ_m	38	21	33	56	52	47	39	97
Cv (%)	4.7	1.4	2.1	4.2	7.6	3.8	2.9	8.4
95%(+/-)	75	41	64	109	103	93	76	190

August (Table 3). Average monthly value of H(0°C) = 4439 m, the range of change: 3974 - 4763 m.
1 ten-day periods. Average monthly value of H(0°C) = 4505 m, the range of change: 4385 - 4574 m.
2 ten-day periods. Average monthly value of H(0°C) = 4615 m, the range of change: 4477 - 4763 m.
3 ten-day periods. Average monthly value of H(0°C) = 4220 m, the range of change: 3974 - 4456 m.

September (Table 3). Average monthly value of H(0°C) = 3721 m, the range of change: 3103 - 4100 m.
1 ten-day periods. Average monthly value of H(0°C) = 3764 m, the range of change: 3591 - 3984 m.

2 ten-day periods. Average monthly value of H(0°C) = 3946 m, the range of change: 3756 – 4100 m.
3 ten-day periods. Average monthly value of H(0°C) = 3452 m, the range of change: 3103 – 4008 m.

Table 4

Statistical characteristics of the average monthly and decade average values of heights of zero isotherm (m) above the territory of Kakheti during October

Month	October			
Parameter	Month	1 Decade	2 Decade	3 Decade
Mean	2842	3133	2905	2520
Min	2145	2629	2145	2165
Max	3777	3777	3466	3054
Range	1632	1148	1321	889
Median	2870	3045	2924	2459
St Dev	432	377	413	276
σ_m	79	126	138	87
Cv (%)	15.2	12.0	14.2	10.9
95%(+/-)	155	246	270	171

October (Table 4). Average monthly value of H(0°C) = 2842 m, the range of change: 2145 - 3777 m.
1 ten-day periods. Average monthly value of H(0°C) = 3133 m, the range of change: 2629 - 3777 m.
2 ten-day periods. Average monthly value of H(0°C) = 2905 m, the range of change: 2145 - 3466 m.
3 ten-day periods. Average monthly value of H(0°C) = 2520 m, the range of change: 2165 – 3054 m.

The greatest average monthly value of H(0°C) during August (4439 m) is observed, smallest - during April (2603 m). Average value of H(0°C) from April through October equal to 3622 m. Greatest decade average value of H(0°C) to the second ten-day period of August (4615 m) is observed, smallest - in the first ten-day period of April (2415 m). The greatest intra-monthly amplitude of values of H(0°C) during October (1632 m) is observed, smallest - during July (427 m). The greatest intra-decade amplitude of values of H(0°C) in the second decade of October (1321 m) is observed, smallest - in the first decade of July (160 m).

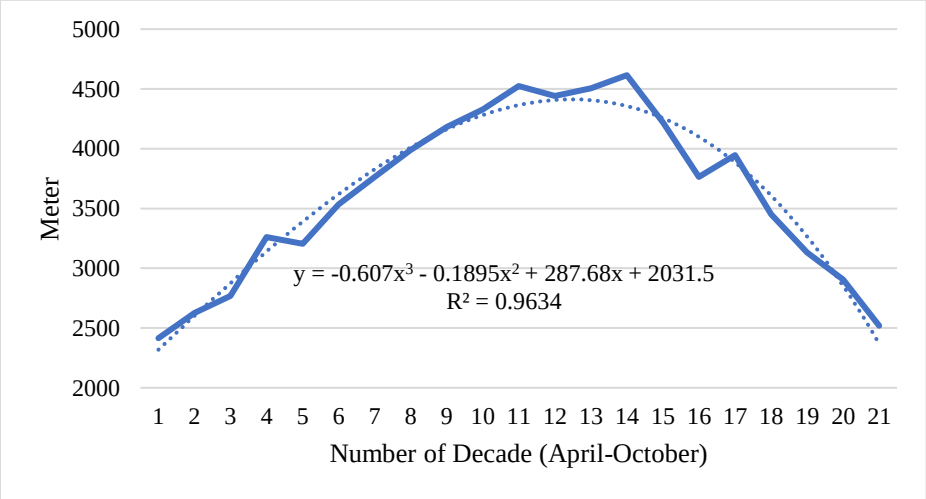

Fig. 2. The time dependence of the decade average values of the level of the zero isotherm above the territory of Kakheti from April through October

As follows from Fig. 2 the time dependence of decade average values of H(0°C) above the territory of Kakheti from April through October it takes the form of the third power polynomial.

Conclusion

In the near future it is provided the continuation of the initiated studies on the study of the influence of climate change in Eastern Georgia [22-25] to the contemporary variations of height of zero isotherm in the atmosphere (preliminary results into [26,27] are obtained), and also the study of the statistical structure of values of H(0°C) in the days with the hail processes at present and its comparison with the analogous works, in the past century carried out [9].

References

[1] Meyson B.Dzh. Fizika oblakov, Gidrometeoizdat, L., 1961.
[2] Sulakvelidze G.K. Livnevyye osadki i grad. Gidrometizdat, 1967, 412 s.
[3] Khorguani V.G. Mikrofizika zarozhdeniya i rosta grada. MO Gidrometizdata, 1984, 188 s.
[4] Abshaev A.M., Abshaev M.T., Barekova M.V., Malkarova A.M. Rukovodstvo po organizacii i provedeniu protivogradovih rabot. ISBN 978-5-905770-54-8, Nalchik, Pechatni dvor, 2014, 500 s., (in Russian).
[5] Kvaratskheliya I.F. Aerologicheskiye issledovaniya v Zakavkaz'ye. Gidrometeoizdat, Leningrad,1964, 248 s.
[6] Kvaratskheliya I.F. Ob osobennostyakh izmeneniya s vysotoy nekotorykh meteorologicheskikh elementov nad Tbilisi. Tr. TbilNIGMI, vyp. 6, 1959, s. 69-77.
[7] Kvaratskheliya I.F. Osnovnyye cherty klimata svobodnoy atmosfery nad Gruzinskoy SSR. Tr. TbilNIGMI, vyp. 10, 1962, s. 25-70.
[8] Nikolayshvili G.V. Aerologicheskaya kharakteristika polya meteorologicheskikh elementov nad Alazanskoy dolinoy. Tr. Vsesoyuzn. Nauchn. Soveshch. po aktivnym vozdeystviyam na gradovyye protsessy. In-t geofiziki AN GSSR, Tb., 1964, s. 71-89, (in Russian).
[9] Salukvadze T.G. Radiolokatsionnyye kharakteristiki gradovykh oblakov s uchetom ikh sezonnogo khoda. Tr. In-ta geofiziki AN GSSR, t. 32, “Metsniyereba”, Tb., 1973, s. 129-138.
[10] Kartsivadze A.I., SalukvadzeT.G., LapinskasV.A. Nekotorie voprosi metodiki vozdeistvia na gradovie processi s ispolzovaniem protivogradovoi sistemi “Alazani”. Trudi Instituta Geofiziki AN Gruzii, t. 36., 1975, s. 13-27, (in Russian).
[11] Amiranashvili A., Dzodzuashvili U., Lomtadze J., Sauri I., Chikhladze V. Some Characteristics of Hail Processes in Kakheti. Trans. of Mikheil Nodia institute of Geophysics, ISSN 1512-1135, vol. 65, Tb., 2015, pp. 77 – 100, (in Russian).
[12] Amiranashvili A., Bakhsoliani M., Begalishvili N., Beradze N., Beritashvili B., Rekhviashvili R., Tsintsadze T., Rukhadze N. On the Restoration of Precipitation Modification Activities in Eastern Georgia.Trans. of the Institute of Hydrometeorology of Acad. of. Sc. of Georgia, ISSN 1512-0902, vol. 108, Tbilisi, 2002, pp. 249-260, (in Russian).
[13] Amiranashvili A., Bakgsoliani B., Begalishvili N., Beritashvili B., Rekhviashvili R., Tsintsadze T., Chitanava R. On the Necessity of Resumption of Atmospheric Processes Modification Activities in Georgia. Trans. of the Institute of Hydrometeorology, Georgian Technical University, ISSN 1512-0902, 2013, vol. 119, pp.144-152, (in Russian).
[14] Amiranashvili A., Ghlonti N., Dzodzuashvili U., Lomtadze J., Chikhladze V. On the Renewal of Anti-Hail Works in Georgia. Int. Conf. “Advanced Problems in Geophysics”. Reports, presented on the Scientific Conference “80 years of the M. Nodia Institute of Geophysics”. Tb., 2014, pp. 208-212, (in Russian).
[15] Amiranashvili A., Burnadze A., Dvalishvili K., Gelovani G., Ghlonti N., Dzodzuashvili U., Kaishauri M., Kveselava N., Lomtadze J., Osepashvili A., Sauri I., Telia Sh., Chargazia Kh., Chikhladze V. Renewal Works of Anti-Hail Service in Kakheti. Trans. of Mikheil Nodia Institute of Geophysics, ISSN 1512-1135, vol. 66, Tb., 2016, pp. 14 – 27, (in Russian).
[16] Amiranashvili A., Dzodzuashvili U., Lomtadze J., Sauri I., Chikhladze V. Meteorological Radar and Radar Ensuring Active Impacts on Atmospheric Processes in Kakheti. Trans. of Mikheil Nodia Institute of Geophysics, ISSN 1512-1135, vol. 65, Tb., 2015, pp. 101 – 112, (in Russian).

[17] Amiranashvili A., Ghlonti N., Dzodzuashvili U., Lomtadze J., Chikhladze V. O vosstanovlenii sluzhby bor'by s gradom v Kakhetinskom regione Gruzii. Doklady Vserossiyskoy otkrytoy konferentsii p ofizike oblakov i aktivnym vozdeystviyam na gidrometeorologicheskiye protsessy, posvyashchennoy 80-letiyu El'brusskoy vysokogornoy kompleksnoy ekspeditsii AN SSSR, 7-9 oktyabrya 2014 g., chast' 2, FGBU «Vysokogorniy Geofizicheskiy Institut», Nal'chik, 2015, s. 132-139, (in Russian).
[18] Amiranashvili A.G., Chikhladze V.A., Dzodzuashvili U.V., Ghlonti N.Ya., Sauri I.P. Reconstruction of Anti-Hail System in Kakheti (Georgia). Journal of the Georgian Geophysical Society, ISSN: 1512-1127, Iss. B, Physics of Atmosphere, Ocean and Space Plasma, vol.18B, Tb., 2015, pp. 92-106.
[19] Abaiadze O., Avlokhashvili Kh., Amiranashvili A., Dzodzuashvili U., Kiria J., Lomtadze J., Osepashvili A., Sauri I., Telia Sh., Khetashvili A., Tskhvediashvili G., Chikhladze V. Radar Providing of Anti-Hail Service in Kakheti. Trans. of Mikheil Nodia Institute of Geophysics, ISSN 1512-1135, vol. 66, Tb., 2016, pp. 28-38, (in Russian).
[20] Selex ES GmbH · Gematronik Weather Radar Systems. Rainbow®5 User Guide, 464 p., 2015, www. gematronik.com
[21] Avlokhashvili Kh., Banetashvili V., Gelovani G., Javakhishvili N., Kaishauri M., Mitin M., Samkharadze I., Tskhvediashvili G., Chargazia Kh., Khurtsidze G. Products of Meteorological Radar «METEOR 735CDP10». Trans. of Mikheil Nodia Institute of Geophysics, ISSN 1512-1135, vol. 66, Tb., 2016, pp. 60-65, (in Russian).
[22] Budagashvili T., Karchava J., Gunia G., Intskirveli L., Kuchava T., Gurgenidze M., Amiranashvili A., Chikhladze T. Inventory of Greenhouse Gas Emissions and Sinks. Georgia's Initial National Communication on Under the United Nations Framework Convection on Climate Change, Project GEO/96/G31, Tb., 1999, 137 p.
[23] Tavartkiladze K., Begalishvili N., Kharchilava J., Mumladze D., Amiranashvili A., Vachnadze J., Shengelia I., Amiranashvili V. Contemporary climate change in Georgia. Regime of some climate parameters and their variability. Monograph, ISBN 99928-885-4-7, Tb., 2006, 177 p., (in Georgian).
[24] Amiranashvili A., Chikhladze V., Kartvelishvili L. Expected Change of Average Semi-Annual and Annual Values of Air Temperature and Precipitation in Tbilisi. Journal of Georgian Geophysical Society, ISSN: 1512-1127, Iss. B, Physics of Atmosphere, Ocean and Space Plasma, vol. 13B, Tb., 2009, pp. 50 – 54.
[25] Amiranashvili A., Matcharashvili T., Chelidze T. Climate change in Georgia: Statistical and nonlinear dynamics predictions. Journal of Georgian Geophysical Society, ISSN: 1512-1127, Iss. A, Physics of Solid Earth, vol. 15A, Tb., 2011-2012, pp. 67-87.
[26] Bliadze T., Jamrishvili N., Iobadze K., Tavidashvili Kh. Changeability of Height of Zero Isotherm in Kakheti into the Season of the Anti-Hail Works of 2015. Trans. of Mikheil Nodia Institute of Geophysics, ISSN 1512-1135, vol. 66, Tb., 2016, pp. 90-95, (in Russian).
[27] JamrishviliN. K., Tavidashvili Kh. Z. Vertical Distribution of the Monthly Mean Values of the Air Temperature Above the Territory of Kakheti (Georgia) in the Central Months of the Year 2012-2016. Journal of the Georgian Geophysical Society, ISSN: 1512-1127, Iss. B, Physics of Atmosphere, Ocean and Space Plasma, vol.19B, Tb., 2016, pp. 66-72.
[28] Geyvandov E.A., Mazin I.P. Prostoy metod rascheta tayaniya gradin pri padenii. Tr. TsAO, vyp. 51, 1963, s. 57-68.
[29] Shishkin N.S. Oblaka, osadki i grozovoye elektrichestvo. Gidrometeoizdat, L., 1964, 402 s.
[30] Zimenkov V.A., Ivanov V.V. Raschet tayaniya gradin v yestestvennykh protsessakh. Tr. VGI, vyp. 3(5), 1966.
[31] Geladze G.SH., Mdinaradze D.A., Robitashvili G.A., Sulakvelidze G.G. Tayaniye gradin pri padenii nizhe nulevoy izotermy v konvektivnykh oblakakh. Tr. ZakNIGMI, vyp. 55(61), 1975, s. 74-79.
[32] Burnadze A., Varamashvili N., Jamrishvili N., Kveselava N. On the Estimations of the Physical Effectiveness of Anti_Hail Protection. Trans. of Mikheil Nodia institute of Geophysics, ISSN 1512-1135, vol. 66, Tb., 2016, pp. 108 – 115, (in Russian).
[33] Tavidashvili Kh. The Statistical Characteristics of Hourly Values of Isotherm -6°C in the Atmosphere Above Kakheti Territory (Georgia) from April to October. Journal of the Georgian Geophysical Society, ISSN: 1512-1127, Iss. A, Physics of Solid Earth, vol.20A, Tb., 2017, pp. 65-71.
[34] Kobisheva N., Narovlianski G. Climatological Processing of the Meteorological Information, Gidrometeoizdat, Leningrad, 1978, 294 p., (in Russian).

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ნ.ჯამრიშვილი

რეზიუმე

წარმოდგენილია ნულოვანი იზოთერმის სიმაღლის მონაცემების ანალიზის შედეგები კახეთის ტეროიტორიაზე 2012-2016 წლების აპრილიდან ოქტომბრის ჩათვლით. ამჟამად საქართველოში ატმოსფეროს აეროლოგიური ზონდირება არ ტარდება. ამიტომ ნაშრომში გამოყენებულია მსოფლიო აეროლოგიური დაკვირვებათა ქსელის რესურსები http://ready.arl.noaa.gov/READYcmet.php, ამ მონაცემებით შესაძლებელია მეტეოროლოგიური ელემენტების ვერტიკალური განაწილების ექსტრეპოლაცია მსოფლიოს ნებისმიერ წერტილისათვის. კერძოდ, შესწავლილია ნულოვანი იზოთერმის სიმაღლის ყოველდღიური მონაცემების განმეორებადობა 04, 10, 16 და 22 საათებისთვის ყოველი თვის განმავლობაში თბილისის დროით. მიღებულია, რომ ნულოვანი იზოთერმის საშუალოთვიური მნიშვნელობები იცვლება 2603 მ-დან აპრილში 4439 მ-მდე აგვისტოში, ხოლო საშუალოდეკადური მნიშვნელობები 2415 მ-დან აპრილის პირველ დეკადაში 4615 მ-მდე აგვისტოს მეორე დაკადაში.

Среднемесячные и декадные значения уровня нулевой изотермы в атмосфере над территорией Кахетии (Грузия) с апреля по октябрь месяцы

Н. К. Джамришвили

Резюме

Приводятся результаты анализа данных о высоте нулевой изотермы в атмосфере над территорией Кахетии с апреля по октябрь месяцы 2012-2016 гг. В настоящее время в Грузии аэрологическое зондирование атмосферы не проводится. Поэтому в работе использованы ресурсы мировой сети аэрологических наблюдений http://ready.arl.noaa.gov/READYcmet.php, по данным которой возможна экстраполяция вертикального распределения метеорологических элементов для любой точкой Мира. В частности, изучена повторяемость высоты нулевой изотермы по ежедневным данным за 04, 10, 16 и 22 час. по Тбилисскому времени для каждого месяца; получено, что среднемесячные значений нулевой изотермы меняются от 2603 м в апреле до 4439 м в августе, а среднедекадные – от 2415 м в первой декаде апреля до 4615 м во второй декаде августа.