Time-space analysis of air temperature in Russia

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Long-term time series of observed monthly air temperature in Russia have been chosen for several sites. On the basis of monthly data the following characteristics have calculated: annual, seasonal tem and the parameters of seasonal function: B1 and B0 coefficients, which connect with amplitude and intra-annual fluctuations as well as the Se-parameter, which characterizes the intensity of synoptic and synoptic processes. On the first step of the research time series of meteorological characteristics ha used for a restoration of missing data and increasing of the length of the basic records for a period 2004 on the basis of system of the methods. As a result an average period of observation has been i from 72 up to 95 years for monthly temperature, up to 98 years for annual temperature and up to 98-1 for seasonal temperature and parameters of intra-annual function. On the basis of continuous record last century the model of time series has been obtained for each site. General structure of time m composition of three different time scale components: interannual, decadal and centurial. On the basi effective statistical methods such as a truncation method and method of smoothing of amplitudes of time scale components' cycles have been extracted. It has been established that a structure of time m components of interannual and decadal time scales is stochastic. Modern climate change may be chara by a dynamic of centurial scale component. There are three main interpretations for a dynamics of components: stationarity, monotonous dynamics (trends as a part of cycle) and step-dynamics (jumpin kind of dynamics connects with the particular mechanism of climatic system: equilibrium system pr monotonous dynamics, but non-equilibrium system forms a step dynamics. Analysis of many hundreds allow to conclude that the most popular model of time series of temperature characteristics in Ru model of step dynamics. This model explains up to 20-30% of general long-term variation. The r of the research has been connected with a classification of obtained dynamics of long-term climate components of centurial time scale. New methods of regionalization have been developed for this ai connect with correlation criteria. Using of the developed methods of classifications the whole area of has been divided into several homogeneous regions with the practically the same kind of the climate d inside of each region. In depending on the temperature characteristic (annual, seasonal, parameters annual function) it was extracted from 20 up to 30 homogeneous regions. As it has been established, the with low temperature changes are located in north and west part of Russia and the most significant (increasing) of temperature take place in Siberia. Inside of each homogeneous region the space model created as a linear model with two coefficients: gradient and level of temperature field and a parameter of non-homogeneity. The obtained result of tendencies in parameters and coefficients of regional m discussed for aims of monitoring of regional climate.