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Fractal Features of the Large-scaled Low Frequency Atmospheric Processes and Structures: Energy and Angle Moment Balance Approach

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The fractal structures (with fractal dimension D$\sim$4/3) may be realized in different systems (Mandelbrot, 1983) , including the atmospheric turbulence, ocean and hydrological systems. New method of monitoring the low-frequency planetary scale processes on the basis of observing some summated contributions of low frequency oscillations for geophysical factors is developed. It is based on the energy and angle moment balance relations and new scheme for calculation of the macro-turbulence regime in typical atmospheric processes, which are known as atmospheric circulation forms (Glushkov et al, 2001-2005). The well known Oorte approach is generalized. The fractal features for large-scaled low-frequency atmospheric processes and atmospheric formations energy evolution are studied. The balance analysis allows to predict the large-scaled atmospheric transformations and teleconnection phenomena and to give their quantitative description. We carried out a group of numerical experiments on calculation of the energy and angle moment and moisture turnover in the Pacific ocean region. The current function (complex velocity) fields are calculated for typical atmospheric circulation's forms. The experiments allow quantitatively defining a link between atmospheric turnover and atmospheric circulation forms through the front divider position and typical low frequency process of conservation of the angle moment balance.

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