



On the Spectral Structure of Circulation Patterns and Their Relations

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The long-term behaviour of global circulation spectral structures is presented in the study. To represent an objective characteristics of circulation patterns the spectral structure of both stratospheric and tropospheric fields is analysed in terms of spherical harmonics coefficients of expansions for selected variables (potential vorticity, sea level pressure, geopotential) based on NCEP/NCAR database of reanalyses for period 1948-2005. Temporal analyses of significant spherical harmonics are introduced as well as the relations between them. Connections of the relations to selected circulation indices and solar and geomagnetic activity indices are analyzed. The analysis on daily basis is added for selected spherical harmonics relation. The systematic review of the appropriate correlations and linear regression analysis are presented, long-term changes of the relations are studied for some of wave numbers as well.