



On the analysis of spectral composition of solar irradiation and changes with solar activity, connections to circulation patterns

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The detailed analysis of spectral composition of solar irradiation reconstructed by Lean et al. (1995) is presented. Beside of systematic increase of total irradiation as well as the increase in most of the spectrum, especially significant in UV part, opposite behaviour can be seen in spectral band of near infrared (1525-1825 nm). The relations of individual spectral bands to solar flux F10.7 is analyzed as well as to long-term behaviour of global circulation spectral structures 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 some sets of solar and geomagnetic activity parameters are analyzed. The systematic review of the appropriate correlations and linear regression analysis are presented, long-term trends are studied for some of wave numbers as well.