**Solar Hale cycle manifestations in geophysical and climatic characteristics**

S.V. Veretenenko1, P.B. Dmitriev1, V.N. Obridko2

1 Ioffe Institute, St. Petersburg, Russia

2 IZMIRAN, Troitsk, Russia

Oscillations with periods of ~22 years close to the magnetic Hale cycle on the Sun are observed in a large number of climatic characteristics, such as occurrence of droughts, occurrence of hurricanes over the Atlantic and Pacific oceans, regional temperatures and pressure etc. The amplitudes of bidecadal oscillations are not only comparable with those of the 11-year ones, but often exceed them. In this work we study the manifestations of the solar magnetic Hale cycle in different geophysical characteristics, which can contribute to the formation of bidecadal oscillations in the Earth’s climate. It was found that in even and odd solar cycles (according to the Zurich numbering) there are statistically significant differences in temporal variations of cosmic ray fluxes in the stratosphere, as well as in geoeffective components of solar wind magnetic fields and geomagnetic activity characteristics (aa-index, occurrence of magnetic storms with gradual commencement). The obtained results allow suggesting that bidecadal oscillations in the Earth’s climate characteristics may be related to the solar Hale cycle, which contributes to the formation of bidecadal variations in fluxes of energetic charged particles (cosmic rays and auroral electrons) entering the atmosphere of high latitudes and influencing the ionization rate. The ionization rate changes, in turn, influence the chemical composition and the temperature regime of the high-latitudinal atmosphere, resulting in circulation changes.