ON SOLAR-ATMOSPHERICAL RELATIONSHIP

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The current 23-d solar cycle explicitly demonstrates a rather strong relation between the meteorological and solar activity events suspected by E. Brukner in the year 1890. To prove this it is sufficient to note the close coincidences between the strongest solar flares and the meteorological anomalies occurred during the current years. The chief specific character of the cycle 23 is its coincidence with the epoch of the 100-year solar cycle maximum and that of the Brukner's cycle. Moreover, the cycle 23 has a marked longitudinal dependence of activity. Thus basing on the daily Wolf numbers the current cycle may turn out to be higher then even the cycle 19! All these relations confirm our previous result about that up to 30 natural baric anomalies may be due to solar effects (Smirnov and Kononovich 1996). As a result of wide field of investigations it is possible to state that the character and amplitude of the atmospheric response strongly depends upon a lot of certain initial conditions. Among them there are: the phase of the solar cycle; the power of the corresponding solar event (flare, CME, outburst etc.); its location on the solar disk; the real plasma and magnetic situation in the interplanetary space during the propagation time of the disturbance such as blast wave or steamer (it is effected by the remains of the previous history); the state of the Earth magnetosphere; the type of circulation process exerting the lower atmosphere in the moment of the magnetic storm commencement (this is connected with the season); the conditions of the unstable energy active regions. The reality of the helio - gemagnetical connections is supported by the quasi-biennial oscillations (QBO) discovered both in the solar cycle spectrum and for meteorological processes. There is an evidence about the dynamical integrity of the upper, middle, and lower atmosphere. The lower atmosphere influences the middle and the upper ones by means of planetary waves, gravity waves and tides. The corresponding scenario of the possible influence of the QBO produced by solar cyclicity is suggested. The frequency analysis of the meteorological parameter variations shows their global character inherent in the middle atmosphere. In these layers the most amount of energy is concentrated in the different kinds of waves. Thus, analysing the energy balance of the Earth atmosphere it is necessary to take into account not only the propagation of the different kinds of radiation, but also the transformation, propagation, absorption and reflection of the waves. For example, the increase of wave absorption in the middle atmosphere and their reflection back may be the cause of the global baric and temperature variations. The corresponding detailing processes are outlined.

Table 1. Parameters of solar observations

Frequency GHz	*Wavelength* mm	*Beam size* arc min	*Temperature* K
11.6	25.9	7.6	12000
22.2	13.5	4.0	9000
36.8	8.2	2.4	7800
77.1	3.9	1.2	7250
87	3.4	1.0	7200

References Brukner E.A.. Klima schwankungen seit 1700. Wien - Olomutz. 1980
Smirnov R.V. and Kononovich E.V., 1996. in: Solar Drivers of Interplanetary and Terrsetrial Disturbances, ASP Conference Series, Volume 95, editors K.S.Balasubramaniam, Stephan L.Kiel, and Raymond N.Smart. P.481