Geophysical Research Abstracts,
Vol. 10, EGU2008-A-10648, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-10648
EGU General Assembly 2008

Possible mechanism of N/S asymmetry of the Sun processes and main cyclicity of the solar activity with period 199.8 yr

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The mechanism of cyclic inversion changes and variations of natural processes of the Earth (and others planets) have been discussed intensively in the last decade. This mechanism is connected with the free and forced relative translational displacements and small turns of non-spherical shells of the Earth - first of all the core and the mantle - under gravitational attraction of the Moon, the Sun and others celestial bodies (Barkin, 2002). We have been described and studied set of inversion phenomena in geodynamics and geophysics (Barkin, 2005; Barkin, Shuanggen, 2006 and oth.): secular, annual and semiannual variations of gravity and geodetic hights; variations of volcano activity and seismic activity and others. Discovered phenomena have been obtained effective confirmations in space geodesy and gravimetric observations (Shuanggen et al., 2002; Blewitt et al., 2003; Daillet, 2006 and oth.). In first inversion phenomena (contrast tendencies in variations of processes) are observed with respect to the northern and southern hemispheres. A set of geodynamical and geophysical phenomena have obtained the dynamical interpretation and the explanation with the help of this geodynamical model. In particular such complex phenomena, as the Mars bipolarity; a concentration of Venus mountains mainly in one hemisphere; the dichotomy structures of some satellites. But we know that many similar inversion phenomena (or asymmetries) are observed in the Sun processes: change of activity between northern and southern hemispheres; contrast variations in rotation regimes of the N/S hemispheres with the certain cyclicities, variation of parameters of asymmetry in the time, others asymmetric phenomena (Li et al., 2001; Badalyan et

al., 2001). We believe that some from mentioned processes can be understood and interpreted from positions of developed model. We believe that this mechanism has universal nature and play important role in geophysical processes on all celestial bodies, including Sun and another's stars (Barkin, 2002). According to the developed model in all mentioned solar processes the gravitational influence of planets and, first of all, the Jupiter and Saturn on non-spherical and eccentric shells of the Sun should play the important dynamic role. The Sun core and its external shell (the convective zone) can play the role of the Earth's core and mantle in considered translational displacements. This mechanism we suggest for explanation of the observed data about variations of Sun diameter (Sun shape) and its activity and their possible correlations. The phenomenon of cyclic inversion of contraction and expansion of the northern and southern hemispheres of the Sun with the main period of the solar activity is predicted. Also small linear trend (or long-periodic variation) of mentioned variations also can be observed. Some preliminary evaluations of parameters of discussed phenomena have been obtained on the base of the known results on the study of the Sun diameter variations (Sveshnikov, 2003 and oth.). We have evaluated that chord of the Sun parallel to its equator with a latitude **Q** is varying on the low **dL=[At+Bsin(w(t-to))]sinQcosQ**. Here **B=0.150** is given in arc seconds (ars) and **A=0.009** is given in ars/yr. **to = 1970.0 (yr)** is a initial moment of the time. w is the frequency corresponding to period in **11.1 yr**. Other cyclicities of the solar activity also will be observed in variations of hemispheres shapes. Spectral studies of variations of solar activity for last **250 yr** have allowed to reveal interannual and decade cyclicities (Kaftan, 2004). We shall result here values of the periods (with errors), the revealed variations, by way of their decrease (values are given in years): **51.8+/-0.5** (50.0); **40.9+/-0.3** (40.0); **33.3; 28.8+/-0.2** (28.5); **24.0+/-0.2** (25.0); **21.3+/-0.1** (22.2); **19.0+/-0.1** (18.2); **17.1+/-0.1** (16.7); **15.2+/-0.1** (15.4); **14.2+/-0.1** (14.3); **13.4+/-0.1** (13.3); **13.1+/-0.1** (12.5); **11.9+/-0.01** (11.8); **11.0+/-0.01** (11.1); **10.6+/-0.01** (10.5); **10.0+/-0.03** (10.0); **9.4+/-0.2** (9.51); **9.2+/-0.1** (9.08); **8.8+/-0.02** (8.70); **8.4+/-0.01** (8.33); **8.1+/-0.1** (7.99); **7.9+/-0.02** (7.69); **7.5+/-0.02** (7.40); **7.1+/-0.01** (7.14); **6.7+/-0.02** (6.67); **6.4+/-0.02** (6.45); **6.2+/-0.2** (6.24); (5.75); **5.5+/-0.01** (5.55); (5.00); **4.8+/-0.01** (4.76); **4.6+/-0.01** (4.54). In parentheses the appropriate values of the periods calculated on one fundamental period **To=199.8 yr** under formula **Tn=To/n (n=4,5,6, ...)** are presented. According to developed model to this period there can correspond fundamental oscillation of the system "the core-convective zone" and barycenter of solar system. The orbital period of Jupiter Tj and period To determine the period of the main variation of solar activity in **11.1978 yr**.