45-year oscillations of Earth rotation and equatorial solar asymmetry

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The correlation between the 45-year oscillations of the Earth rotation and equatorial solar asymmetry is investigated by means of Universal time UT1 series for the period 1623.5-2005.5, Wolf's number variations for the period 1749-2008 and Index of the equatorial solar asymmetry for the period 1874.4-2008.8. The Index Sa of equatorial solar asymmetry is determined as relation between the sunspot areas of northern hemisphere Sn and southern hemisphere Ss by the formula Sa=(Sn-Ss)/(Sn+Ss). The data of corrected monthly values of Sn and Ss, collected by the Royal Greenwich Observatory and USAF/NOAA and compiled by the Solar Physics Group at NASAś Marshall Space Flight Center are used. The 45-year cycles of UT1 and solar asymmetry are determined by Fourier approximation of the data and separation of 5 harmonics of UT1 oscillations with periods between 34.8a and 54.7a and 2 harmonics of solar asymmetry oscillations with periods 33.6a and 44.7a. Extended time series of 22-year cycles of the monthly mean Wolf's numbers are used, which are determined by sign alternation of the odd sunspot's cycles. The odd and even 22-year cycles of the solar activity are correlated with the positive and negative semi-cycles of the 45-year UT1 oscillation. The 45-year cycles of UT1 and solar asymmetry are highly correlated with time delay of about 11 years.