

CHARACTERISTICS OF 30-70 DAY FLUCTUATIONS OF THE LENGTH OF DAY AND ATMOSPHERIC ANGULAR MOMENTUM

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The length of day (LOD), the atmospheric angular momentum (AAM) and the relative sunspot number (RSN) time series at 5-day intervals, which are spanning 13 years from 1976 through 1990, have been analysed in order to study the 30-70 day fluctuations. The filtered series with the 30-70 day band-pass of the three kinds of data were obtained by the Multi-Stage Filter. The five spectral peaks in both filtered series have been detected by the AR spectrum with the order of AR models as less than 3 percent of the sample number of each series. The amplitude estimates for the five periods in each series appear basically in equal distribution, and there is not a dominant one. The amplitudes of the averaging period for the five periods of LOD and AAM series decrease obviously with the increasing of sample number. The randomness of three series of periodic variations calculated from LOD, AAM and RSN was inspected by using the independence test and the link test of Statistics. Both tests for LOD and AAM are satisfied but RSN is not. From the above mentioned analysis, it is shown that the 30-70 day fluctuations both in LOD and AAM have the features of random walks in time scale and do not have a stable and periodic oscillation.

According to the results of the cross-correlation estimates between LOD, AAM and RSN series, it can not be confirmed that the solar activities can affect the solid Earth in the time scale of 30-70 day through atmosphere directly.