



Synodic variation of precipitation in the spotlight of different time scales

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Attempts to find statistical relationship between rainfall and lunar phase (synodic month) had met a lot of criticism during times, when such studies had been more or less “fashionable”. The phenomenon was nevertheless studied in details during the second half of the 20th Century by many authors worldwide, e. g. by Adderley and Bowen in Australia, Andrlík in former Czechoslovakia, Bradley et al. in the USA, Gobinathan et al. in India or Cevolani and Bortolotti in Italy. The authors used wide variety of climatic databases and various statistical manipulations of data. It was demonstrated that extreme precipitation events occur more frequently on the third to fifth day after syzygies (“Bowen’s signal”) but the research activities did not survive the end of the century.

In our papers since 1990s we have tried to carry on the study for an extremely long series at Prague-Klementinum (daily precipitation in 1804-2007) in order to verify the hypothesis of secular changes in manifestation of the effect. We used method of superposition of epochs with synodic month as the epoch and new moon as the zero day. The number of synodic months superposed into one row altered from 12-13 (one calendar year) to as much as ca 250 (20 years). It was found that different “temporal focusing” exposed diverse effects in long-term behaviour of Bowen’s signal. The shortest period of superposition may indicate some role of other lunar orbital periods. Summing the rainfall data for about five years demonstrated quasi-periodical behaviour of the phenomenon with the largest changes occurring at most cases two years before solar activity minima. The data suggest that the sign of the changes alternates in 22-year rhythm what may imply the role of solar magnetic (Hale) cycle. Further interesting results indicate spatial variation over European continent when tens of years were taken

into account.