

## IS THE SOLAR ACTIVITY CYCLE SYNCHRONIZED WITH THE SOLAR INERTIAL MOTION?

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Synchronization of coupled oscillating systems means appearance of certain relations between their phases and frequencies. We use this concept in order to address the inverse problem and to reveal interaction between systems from experimental data. We demonstrate how the phases and frequencies can be estimated from time series and present techniques for detection and quantification of synchronization. We apply our approach to the record of annual sunspot numbers and the solar inertial motion. Phase synchronization between both is found with statistical significance for three epochs (1727-1757, 1802-1832 and 1863-1922).