



Quasi-biennial oscillations in the surface air temperature and in the NAO index are phase-synchronized

M. Palus (1) and D. Novotna (2)

(1) Institute of Computer Science, Academy of Sciences of the Czech Republic,
Pod vodarenskou vezi 2, 182 07 Prague 8, Czech Republic, E-mail: mp@cs.cas.cz;

(2) Institute of Atmospheric Physics, Academy of Sciences of the Czech Republic,
Bocni II/1401, 141 31 Prague 4, Czech Republic, E-mail: nov@ufa.cas.cz

Recently, Palus and Novotna (Nonlin. Proc. Geophys. 11, 2004, 721-729) have proposed an enhanced Monte Carlo Singular System Analysis (MC SSA) in which, in addition to the signal covariance structure, a complexity measure of the SSA modes is tested against surrogate data; and were able to detect a period 7.8 years oscillatory mode in long-term monthly near-surface air temperature records from several European locations, as well as in the monthly NAO index. In this paper we show that the same method is able to bring evidence for the presence of the quasi-biennial oscillations (QBO) with the period of approximately 27 months in both the air temperature data and in the NAO index. The QBO modes are extracted from the raw data (expressed in the SSA/EOF basis), their instantaneous phases are computed and their relations are studied by the means of synchronization analysis. The statistical evidence is obtained that the QBO modes from the temperature and from the NAO index are phase-synchronized.

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