**Detrended-Windowed Autocorrelation Function: a new method for detecting timers’ exploitation**

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Delignières, Lemoine & Torre (2004) have evidenced that event-based and dynamical timers may be distinguished by comparing the high-frequency slopes of power spectra. This method, nevertheless, necessitates the collection of long series to provide reliable results.

We have developed a new method allowing discriminating the nature of the exploited timer: the Detrended-Windowed Autocorrelation Function (DWAF). This method is based on the analysis of the lag-one autocorrelation, which is supposed, for short series, to be negative for event-based timers (Wing & Kristofferson, 1973) and positive for dynamical timers (Delignières et al., 2004). The principle of DWAF is to apply a windowed autocorrelation, moving along the series by steps of 1 point. In each window the series is detrended, and finally the obtained lag-one autocorrelation estimates are averaged.

The present study aimed at determining the optimal parameters of DWAF, allowing the best discrimination between timers. We tested two orders of detrending (linear and order 2) and four windows lengths (20, 30, 40, 50 points). DWAF gave best results than power spectra with a detrending of order 2 and a 20-point window for event-based timers, and a linear detrending with a 50-point window for dynamical timers. The best compromise is a detrending of order 2 with a 30-point window.
