

## ***Interactive comment on “Speleothem stable isotope reference records for East-Central Europe – Resampling sedimentary proxy records to get evenly spaced time-series with spectral control” by I. G. Hatvani et al.***

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We would like to thank the Reviewer #1 for her/his suggestions. We would like to give an update on the progress of the test she/he suggested regarding, what we think is the most crucial issue in her/his comments.

Based on the suggestion, we selected a well-studied record with a pronounced periodic signals to test the performance of our approach. Seasonal averages were computed from the monthly mean total sunspot number (WDC\_SILSO, 2017) and randomly re-

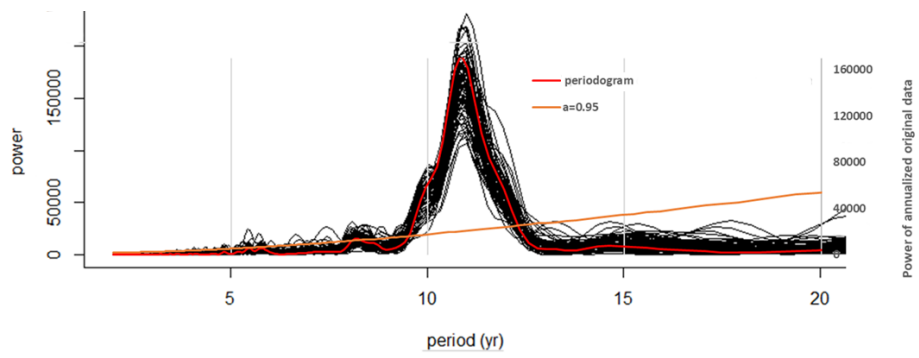
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sampled. Seven data points were taken randomly from each block of 10yrs to replicate the sub-annual resolution of the Baradla speleothem (avg. 0.7 stable isotope data/yr). This was repeated a 100 times, so an ensemble 100 randomly resampled time series were obtained which replicate the resolution of the Baradla  $\delta^{18}\text{O}$  records. As a final step in line with the proposed protocol the 100 randomly resampled time series were spline interpolated and annual averages were formed and were processed using REDFIT to assess their spectral characteristics and compare them to the spectra of the annual averages of the original (sunspot) record.

All the 100 redfit Lomb-Scargle Periodograms (rLSPs) replicated the well-known  $\sim 11$  yr sunspot cycle ( $\alpha > 0.95$ ). Moreover, most of the rLSPs of the un-equally spaced artificial time series mirrored even the smaller peaks (e.g.  $\sim 8$  yrs). However, the noise caused by spline interpolation surfaced in the high-frequency domain (Fig. 1). In our view, these results provide a proper support for the yet untested assumption in the MS.

We hope these results back up the applicability of the methodology proposed on sedimentary proxy datasets, as the ones in the MS. The following results are only preliminary and intend to show the Reviewer #1 the promising progress of the rigorous test she/he suggested. If approved by the Reviewer #1, the results of this test is planned to be attached to the revised version of the MS in a form of a supplement in a more detailed way. Data source: WDC-SILSO, Solar Influences Data Analysis Center (SIDC), Royal Observatory of Belgium, Av. Circulaire, 3, B-1180 BRUSSELS Currently at <http://www.sidc.be/silso/datafiles> accessed on 08.09.2017

Fig. 1. rLSP of the annual mean sunspot numbers (red); and rLSPs of the 100 un-equally spaced artificial (sunspot) time series randomly resampled, spline interpolated and annualized from the monthly mean sunspot numbers (black). The bias-corrected 95% chi-squared limit of a fitted AR(1) process for the rLSPs is shown in orange.



**Fig. 1.** (please see figure caption above)