

Interactive comment on “Effects of dating errors on nonparametric trend analyses of speleothem time series” by M. Mudelsee et al.

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Upon our rectifying note (Mudelsee et al., 2012a) regarding errors and misunderstandings on the internet blog's "Die kalte Sonne" report about our paper (Mudelsee et al., 2012b), the blog authors Vahrenholt and Lüning published an updated report version on their website (<http://www.kaltesonne.de/?p=4139>, 1 July 2012).

The updated report still contains errors and misunderstandings of the scientific content. The update further reveals a serious degree of ignorance of our rectifying note (Mudelsee et al., 2012a).

We continue our regret that Vahrenholt and Lüning were not brave enough to take up
C729

the challenge of a scientific debate here on Climate of the Past Discussions, the place where the original paper appeared.

To conclude this rather one-sided exchange of scientific arguments, we state that a Climate of the Past Discussions paper (Mudelsee et al., 2012b) has been abused and instrumentalized by Vahrenholt and Lüning with regard to their scientifically unsupported claim that solar cycles *dominate* Earth's climate on decadal to millennial timescales.

We consider that the series of errors and misunderstandings committed by Vahrenholt and Lüning, in addition to their ignorance and lack of bravery, has not raised the level of their scientific reputations.

1. The datings tools considered in our paper include also radiocarbon technology. The updated blog report still fails to mention this.

2. Vahrenholt and Lüning's blog still reports that as a result of our statistical analyses, characteristic cycles on centennial to millennial timescales had emerged (blog: "Zum Vorschein kamen charakteristische Zyklen im Jahrhundert- bis Jahrtausend-Maßstab."), completely ignoring our rectifying note (Mudelsee et al., 2012a, p. C645).

As we wrote in our rectifying note, our discussion paper *does deal with* smoothing or nonparametric regression. The resulting trend curves, wrongly described by Vahrenholt and Lüning as "cycles", do *necessarily* exhibit long-term variations on centennial to millennial scales because *with full intention* we had set the smoothing bandwidth equal to 250 a.

As we further wrote in our rectifying note, our discussion paper *does not deal with* the spectrum of the process that generated the climate time series. A spectrum esti-

mation is a suitable statistical tool to detect cyclical variations in observed time series (Mudelsee, 2010, Chapter 5).

This means: our discussion paper (Mudelsee et al., 2012b) does not deal with cycles. Neither can it be used to demonstrate the existence of cycles (solar or other origin), nor to demonstrate the absence of cycles. To write, as Vahrenholt and Lüning did, that we found in our paper (Mudelsee et al., 2012b) characteristic cycles, and to uphold this view in light of our criticism (Mudelsee et al., 2012a), constitutes a misunderstanding of the scientific content of our paper and a case of abusing it for other purposes.

For novices in logical reasoning in scientific research, we add that this statement (“The original discussion paper cannot be used to demonstrate the existence of cycles.”) is independent of statements on other issues (e.g., “The Bond cycle exists.”) in other papers, for example in papers that study the same datasets by means of spectrum estimation.

3. Taking into account the other content on the Vahrenholt and Lüning blog (<http://www.kaltesonne.de>, 1 July 2012), it appears to us that the mentioned purpose, for which our Climate of the Past Discussions paper has been abused and instrumentalized, is the view that solar cycles have a dominating influence on Earth’s climate on decadal to millennial timescales, which, so the view continues, has not been previously recognized by climate scientists.

4. A personal addition (M. Mudelsee): As a climate researcher who works on enhancing statistical methods of climate spectrum estimation (Schulz and Mudelsee, 2002; Mudelsee et al., 2009; Mudelsee, 2010, Chapter 5), applied spectrum estimation and detection of solar cycles in climatic time series (see, for example: Neff et al., 2001; Burns et al., 2002; Fleitmann et al., 2003, 2004, 2007; Niggemann et al., 2003;

C731

Holzkämper et al., 2004; Abram et al., 2007; Berkelhammer et al., 2010; Fohlmeister et al., 2012; Scholz et al., 2012)—some of these papers were abused by others in a manner similar to that employed by Vahrenholt and Lüning—it is my duty to repeat my reminder issued to Vahrenholt and Lüning: “Furthermore, the word ‘dominate’ should be used with caution—the area under a spectral peak is, in nearly all cases of climate spectrum estimation, small compared to the total area (i.e., the variance, S^2)” (Mudelsee, 2010, p. 195). This is my duty not because I imagine that Vahrenholt and Lüning will embark on studying and acquiring competence in the estimation of climate spectra and the reporting about solar cycles, but because I want to encourage and inform younger students of climate, who may happen to read these lines, that it is important to obtain a certain level of technical competence in mathematical methods before making bold statements about Sun–climate relations.

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C732

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C733

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C734