

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

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On the internet blog “Die kalte Sonne” by Vahrenholt and Lüning appeared a report (<http://www.kaltesonne.de/?p=4139>, 24 June 2012) in German about our discussion paper (Mudelsee et al., 2012). The blog report contains errors and misunderstandings of the scientific content, which we rectify here. We regret that the blog authors had not attempted to put their ideas on this discussion forum of Climate of the Past.

1. The datings tools considered in our paper were radiocarbon and U/Th technology, not U/Pb (blog: “Uran-Blei-Methode”).

2. The blog 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.”).

Vahrenholt and Lüning misunderstand the mathematical science of smoothing and spectrum estimation (“cycle detection”). With full intention our paper (Mudelsee et al., 2012, p. 1987) looked into longer-term trends by setting the kernel smoothing bandwidth equal to 250 a. The resulting trends necessarily exhibit ups and downs (“wiggles”) on that timescale. We did not perform a spectrum estimation, a result of which may or may not had been the detection of cycles that are associated with solar activity variations or with other influences.

3. As regards the popular idea that cycles in solar activity and other influences dominate Earth’s climate, we take the liberty and remind 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).

Mudelsee, M.: Climate Time Series Analysis: Classical Statistical and Bootstrap Methods, Springer, Dordrecht, <http://www.manfredmudelsee.com/book>, 2010.

Mudelsee, M., Fohlmeister, J., and Scholz, D.: Effects of dating errors on nonparametric trend analyses of speleothem time series, *Clim. Past Discuss.*, 8, 1973–2005, doi:10.5194/cpd-8-1973-2012, 2012.

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