



Spectral analysis of 2000 year global proxy temperature data

Carl Otto Weiss (1) and Horst-Joachim Luedecke (2)

(1) CINVESTAV Queretaro, Mexico (carl.weiss@gmx.de), (2) Univ. of Appl. Sci., Saarbruecken, Germany (moluedecke@t-online.de)

Spectral analysis of 2000 year global proxy temperature data

H.-J. Luedecke*, C. O. Weiss**

The proxy temperature records utilized in /1/ represent about 500,000 individual measurements. These together with satellite- and HADCRUT4 data for the recent past were used to construct a global temperature history for the past 2000 years by averaging the different records. The “climate” according to definition was obtained as the 30 year running average of the yearly data. The climate curve thus obtained shows clearly the historically known extrema (Roman optimum, Medieval optimum, Medieval little ice age; and, very pronounced, the historically documented minimum of 1450). Evidently, the climate curve shows the warming from 1870 to 1990. The yearly data were then Fourier-analyzed. The spectrum shows 3 overwhelmingly dominant cycles of 1003, 463 and 188 years period, already known from local studies, along with a number of rather weaker cycles. According to the dominance of the 3 main cycles, the sum of these cycles closely represents the climate curve obtained by the 30 year averaging (with correlation of 0.8). The cycle sum also exhibits rather precisely the warming from 1870 to 1990, which is usually attributed to influence of CO₂.

This latter result was recently independently confirmed /2/ by neural network prediction of the period 1870 to 1990 temperature, based on patterns contained in proxy temperature data from 0 AD to 1830 AD, for various locations worldwide. These findings point to a rather low climate sensitivity of CO₂.

References:

/1/ H.-J. Luedecke, C. O. Weiss; The Open Atmospheric Science Journal 11 (2017), 44. See the references # 52, 53, 54, 55, 2 therein for the proxy data

/2/ J. A. Abbot, J. Marohasy, GeoResJ 14, (2017), 36

* Univ. of Appl. Sci. Saarbruecken, Germany

** CINVESTAV, Queretaro, Mexico; visiting from PTB Braunschweig, Germany