



Synchronicity of Antarctic temperatures and local solar insolation on orbital time-scales

T. Laepple, M. Werner, and G. Lohmann

Alfred-Wegener-Institute for Polar and Marine Research, Paleo-Climate Dynamics, Bremerhaven, Germany
(tlaepple@awi-bremerhaven.de)

The Milankovich theory states that the global climate variability on orbital time-scales is dominated by the summer insolation at high northern latitudes. One supporting evidence is that reconstructed air temperatures in Antarctica are nearly in phase with the boreal summer insolation and out of phase with the local summer insolation. Antarctic climate is therefore thought to be driven by northern summer insolation. However a clear mechanism that links the two hemispheres on this time-scale is missing. Here we propose the alternative hypothesis that key Antarctic temperature records derived from ice-cores are biased towards austral winter because of a seasonal cycle in snow accumulation. Using present day estimates of this bias in the ‘recorder’ system, we show that the local insolation can explain the temperature record without having to invoke a link to the Northern Hemisphere. Therefore, the Antarctic ice-core- derived temperature record cannot be used to support the Milankovitch hypothesis.