Geophysical Research Abstracts
Vol. 14, EGU2012-5005, 2012
EGU General Assembly 2012

On the estimation of minimum anthropogenic trends in regional averaged temperature records over China

N. Yuan (1,2) and A. Bunde (2)

(1) Peking University, School of Physics, Beijing, China (naimingyuan@hotmail.com), (2) Institute for Theoretical Physics, Justus-Liebig-University Giessen, Giessen, Germany

In order to evaluate and compare possible anthropogenic trends in China, we study in the 8 climate regions of China the averaged minimum, maximum, and mean temperatures over the past 50 years. For obtaining the temperature data, we averaged over a large number of local temperature data in each climate zone. The climate regions are the Northeast, North, East, Southcentral, Southern, Southwest, and Northwest as well as the province of Xinjiang. In order to estimate the minimum anthropogenic trend (MAT) in each climate zone within the 95 percent confidence interval we use the methodology of Lennartz and Bunde [1]. We find that the averaged temperature data show a considerably more pronounced anthropogenic signal than the local temperatures. For the averaged minimum temperatures, the MAT varies from 0.32^0C in Southwest up to 1.51^0C in Xinjiang, for the averaged mean temperatures, the MAT varies from -0.06^0C in Southwest up to 1.05^0C in North, and for the averaged maximum temperature the MAT varies from -1.14^0C in Southcentral up to 0.68^0C in Northwest. While all averaged minimum temperatures show a significant external trend, the averaged mean temperature of Southwest and the maximum temperatures from the southern regions of China (Southwest, Southern, and Southcentral) do not show a significant anthropogenic signal, since their MAT is negative. If we average over all climatic zones in China, the MAT is positive not only for the minimum temperature (1.00^0C), but also for the mean (0.71^0C) and the maximum temperature (0.35^0C).

[1] Lennartz. S., and A. Bunde (2011), Distribution of natural trends in long-term correlated records: A scaling approach, *Phys. Rev. E*, **84**, 021129.