

SEPP Science Editorial #27-2009 (8/29/09)

“Sun spot frequency has an unexpectedly strong influence on cloud formation and precipitation”

Climate modelers seem puzzled that small fluctuations in total solar irradiance (TSI) appear to have large influence on the climate. They feel it necessary to take recourse to complicated mechanisms. For example, Gerald **Meehl** of the US-National Center for Atmospheric Research (NCAR) and his team [1] have been able to calculate how the extremely small variations in TSI bring about a comparatively significant change in the system "Atmosphere-Ocean" They try to explain how ‘sunspot frequency’ has an unexpectedly strong influence on cloud formation and precipitation, according to a press release from the GFZ (German Research Centre for Geosciences), the home of Katja Matthes, a co-author of the study.

One suggested mechanism is a solar-UV enhancement of stratospheric ozone, leading to circulation changes in the troposphere, a possibility explored earlier by British researcher Joanna Haigh. Another complicated mechanism suggested is increased heating and evaporation from cloud-free regions of the ocean, with the additional moisture transported into the equatorial zone, followed by some kind of positive feedback. But the answer may really be very simple: the tiny (~0.1%) variation of TSI during the solar cycle is only the ‘tip of the iceberg.’ The much stronger variability is that of solar activity (solar wind and magnetic fields), which explains the observed modulation of Galactic Cosmic Radiation (GCR); in turn, the GCR affect cloudiness in the lower troposphere (the ‘**Svensmark** mechanism’). And what makes me so sure about the GCR hypothesis? It is the observational evidence from isotopic data in stalagmites (shown in the **NIPCC** summary report [2] and used there to challenge the IPCC conclusions).

But the GCR explanation is not congenial to AGW alarmists, who have been brainwashed by the IPCC. The latest (2007) IPCC report ignores the cosmic-ray effects, and by focusing only on TSI, disingenuously considers solar influences on climate to be insignificant when compared to the forcing by GH gases.

In this sense then, the paper by Meehl et al constitutes some kind of conceptual breakthrough –even if it is not correct in all its conclusions. Professor Reinhard Huettl, Chairman of the Scientific Executive Board of the GFZ agrees: *"The study is important for comprehending the natural climatic variability, which – on different time scales - is significantly influenced by the sun. In order to better understand the anthropogenically induced climate change and to make more reliable future climate scenarios, it is very important to understand the underlying natural climatic variability."*

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1. Meehl, G.A., J.M. Arblaster, K. Matthes, F. Sassi, and H. van Loon (2009), Amplifying the Pacific climate system response to a small 11 year solar cycle forcing, *Science*, 325, 1114-1118. [We note that one of the coauthors is Harry **van Loon**, a pioneer in studies of solar influences on climate.]
 2. NIPCC summary report [*"Nature – Not Human Activity – Rules the Climate"*](#)