

(presented at session SH08 of the AGU in New Orleans. 23-27 May 2005)

## **Climate Sensitivity of Earth to Solar Irradiance: update II**

David H. Douglass, B. David Clader, and Robert S. Knox  
Department of Physics and Astronomy, University of Rochester  
Rochester, NY 14627-0171

This paper is a continuation of a study by Douglass, Clader and Knox (DCKI) [1]. In that paper we determined the solar effect on the lower tropospheric global temperature  $T$  using the Total Solar Irradiance (TSI) of Frohlich and Lean (FL)[2]. The sensitivity  $k$ , determined primarily by the 11 year activity cycle, was found to be twice that expected from a no-feedback Stefan-Boltzmann radiation balance model implying positive feedback. A linear trend of 77mK/decade was also found from that analysis.

Since DCKI it has come to our attention that there is another construction of TSI by Willson and Mordvinov (WM)[3]. The WM TSI shows the familiar 11 year cycle but differs from FL in that they find a positive trend for TSI while FL find a negative trend. We now do a new analysis on  $T$  using the TSI of WM to determine the differences. We expect the sensitivity  $k$  to be nearly the same. However, the linear trend estimate could be significantly reduced.

1. **D. H. Douglass, B. D. Clader, and R. S. Knox, Paper presented at 2004 Solar Radiation and Climate (SORCE) meeting on *Decade Variability in the Sun and the Climate*. See <http://arXiv.org/abs/physics/0411002>.**
2. **C. Fröhlich and J. Lean, *Geophys. Res. Lett.* 25, 4377-4380 (1998). Version 18: <http://www.obsun.pmodwrc.ch>**
3. **R. C. Willson and A. V. Mordvinov. *Geophys. Res. Lett.* 30(5), article 1199 (2003)**