Comment on **Shawn Lovejoy's** presentation

Using Scaling, fluctuation analysis to quantify natural and anthropogenic climate change.

Olavi Kärner

Main statement on page 2:

” In the recent epoch (here, since 1880) solar and volcanic forcings and changes in land use have had very little impact on GCM variabilities, the latter are apparently dominated by anthropogenic emissions.”

Objection:
Comparison of actual RF’s shows different picture.

World Data Center for Greenhouse Gases (WDCGG) website (gaw.kishou.go.jp/wdcgg.html) tells that the concentration of CO_2 in the Earth atmosphere grows at nearly constant rate 1.6 ppm/year. It takes about 320/1.6=200 years to reach 640 ppm from the times at 320 ppm. Computations show that a doubling of CO_2 will cause an increase of OLR flux density $\approx$ 4 Wm^{-2} (Schwartz 2007). The corresponding annual increment in the OLR flux would be 4/200=0.02 Wm^{-2}.

Schwartz S.E. (2007) *J. Geophys. Res.*, **112D** 24505-
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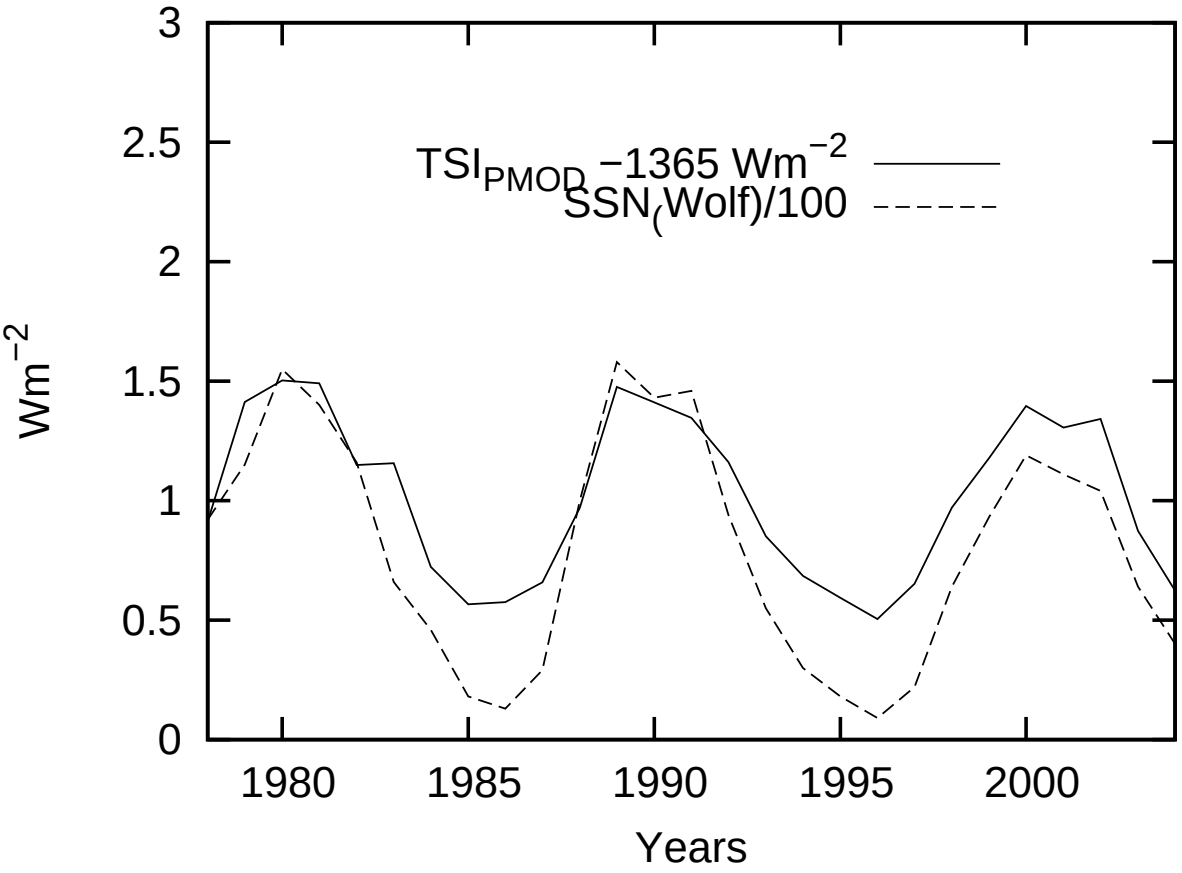

The current annual mean TSI at the TOA varies up 1 Wm^{-2}. The corresponding RF is approximately 0.7/4 = .175 Wm^{-2} The annual production of CO_2 RF (.02 Wm^{-2} appears to be nearly 10 times lower.

TSI at the TOA: **ftp://ftp.pmodwrc.ch/pub/data/**
SSN data: **http:// sidc.oma.be**

1 Actual variability of TSI overshadows the effect of CO_2 concentration increase.

2. Eq (1) is not justified because the dependence of air temperature on TSI variability is not studied.