

ICCC-9 panel 18, Las Vegas, July 7-9 2014

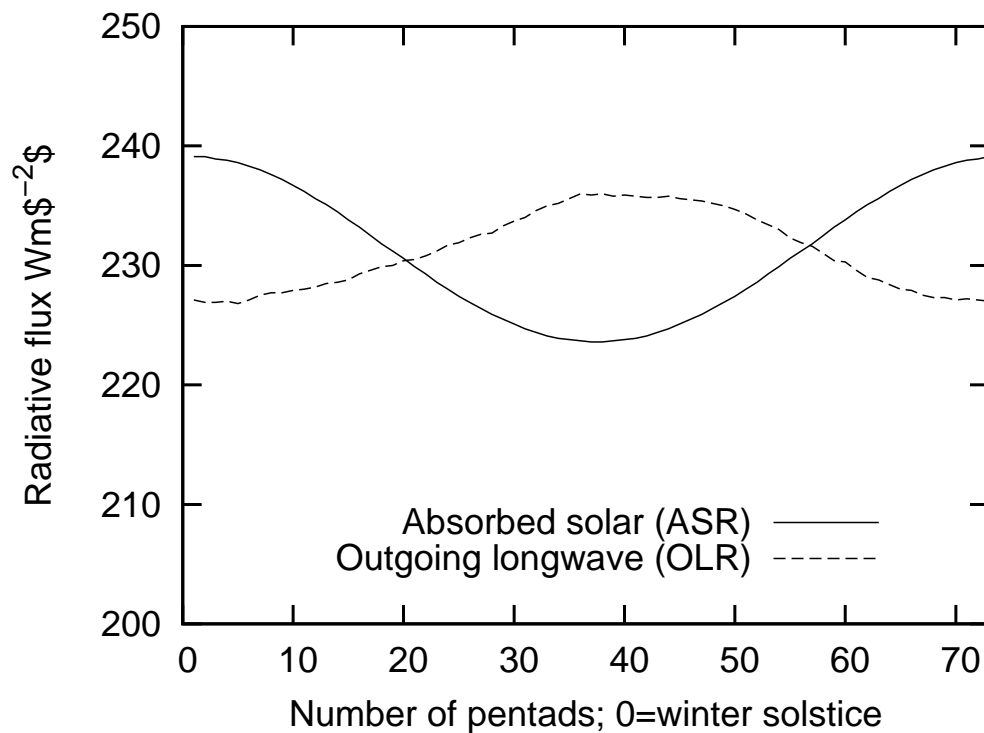
Decline of the Theory on Anthropogenic Global Warming

Olavi Kärner

June 27, 2014

- The IPCC's Theory of Anthropogenic Global Warming (AGW) is based on the idea that increasing concentration of CO₂ is capable to unbalance the Earth radiation budget (ERB), i.e. the difference between absorbed solar and outgoing longwave radiation To restore the balance the Earth temperature must increase.
- Actually, the idea is impertinent because the ERB is rarely balanced, it oscillates together with the Earth-Sun distance.

Idealized annual cycle of the absorbed solar radiation (ASR) and satellite based (rda.ucar.edu/ds684.1) outgoing longwave (OLR) radiation for 1974-1999:



$$ASR = \frac{S_0}{4} \left(\frac{\ell_0}{\ell_t} \right)^2 (1 - a)$$

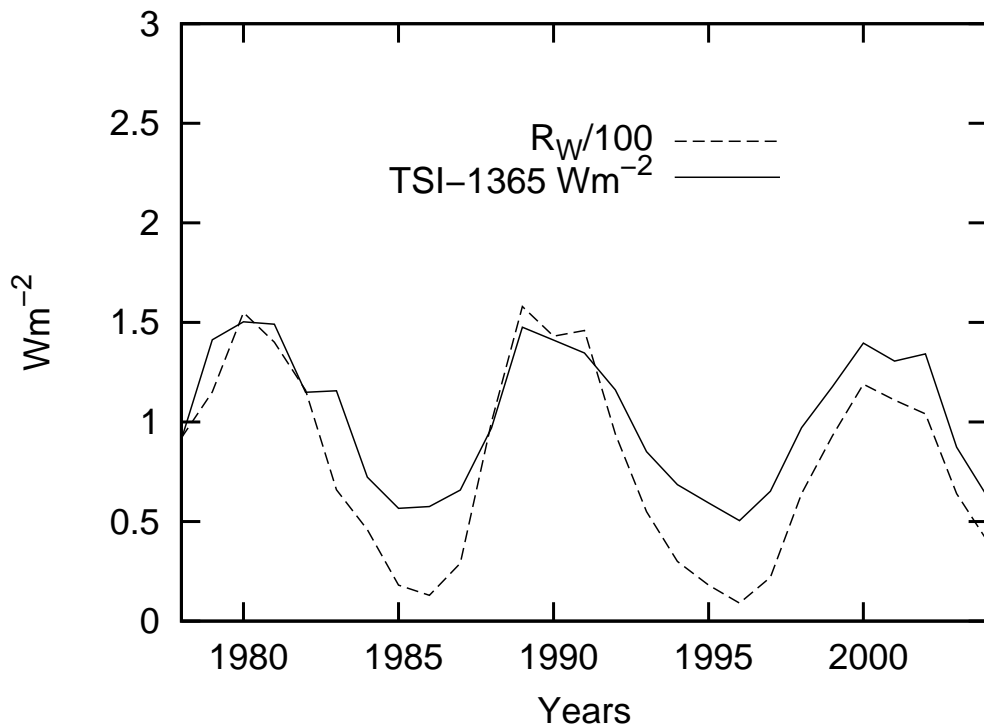
$S_0 = 1365.5 \text{ Wm}^{-2}$, Solar constant

ℓ_0 - Mean Earth-Sun distance

ℓ_t - The distance at pentad t

$a = 0.323$ Adjusted albedo, to get annual ASR-OLR=0

Actual total solar irradiance at the top of the atmosphere (TSI i.e. sample value of S_0) depends upon solar activity (Wolf numbers R_w).



Annual mean values for TSI-1365 Wm⁻² at the TOA from PMOD archive <ftp://ftp.pmodwrc.ch>

Annual values for $R_w/100$ from <http://sidc.oma.be>

Note about 1 Wm⁻² difference.

Albedo a changes are considerable (Kato 2009 *J. Climate* **22**, 4893-4907) mainly due to the varying cloudiness.

Due to independent fluctuations of TSI and albedo an annual imbalance in ERB is expectable.

Experimentally verified global imbalance in ERB:

1. One year mean about 5 Wm^{-2}
Arking and Vemury 1984 *J. Geophys. Res.* **89**, D5089-5097.
2. Five year mean up to 7 Wm^{-2} depending on the satellite
(Loeb et al. 2009 *J. Climate* **22**, 748-766, Table 1).

This means that the influence of growing concentration of CO_2 should be compared to the actual deviations of ERB.

1. Doubling of the CO₂ concentration causes a decrease of global OLR about 4 Wm⁻² (Schwartz 2007 *J. Geophys. Res.* **112**, D24805).
2. Last growth rate about 2.0 ppm/year. The level was 320 ppm in 1965.
About 150 years to reach 640 ppm. The annual change in OLR about 0.03 Wm⁻².
3. The change is negligible in comparison of the natural ERB variability \pm a few Wm⁻².
4. The current increase of CO₂ concentration is unable to change the common oscillation of ERB, thus it is also unable to change our climate.