Influenze astronomiche e oscillazioni naturali del clima terrestre ...

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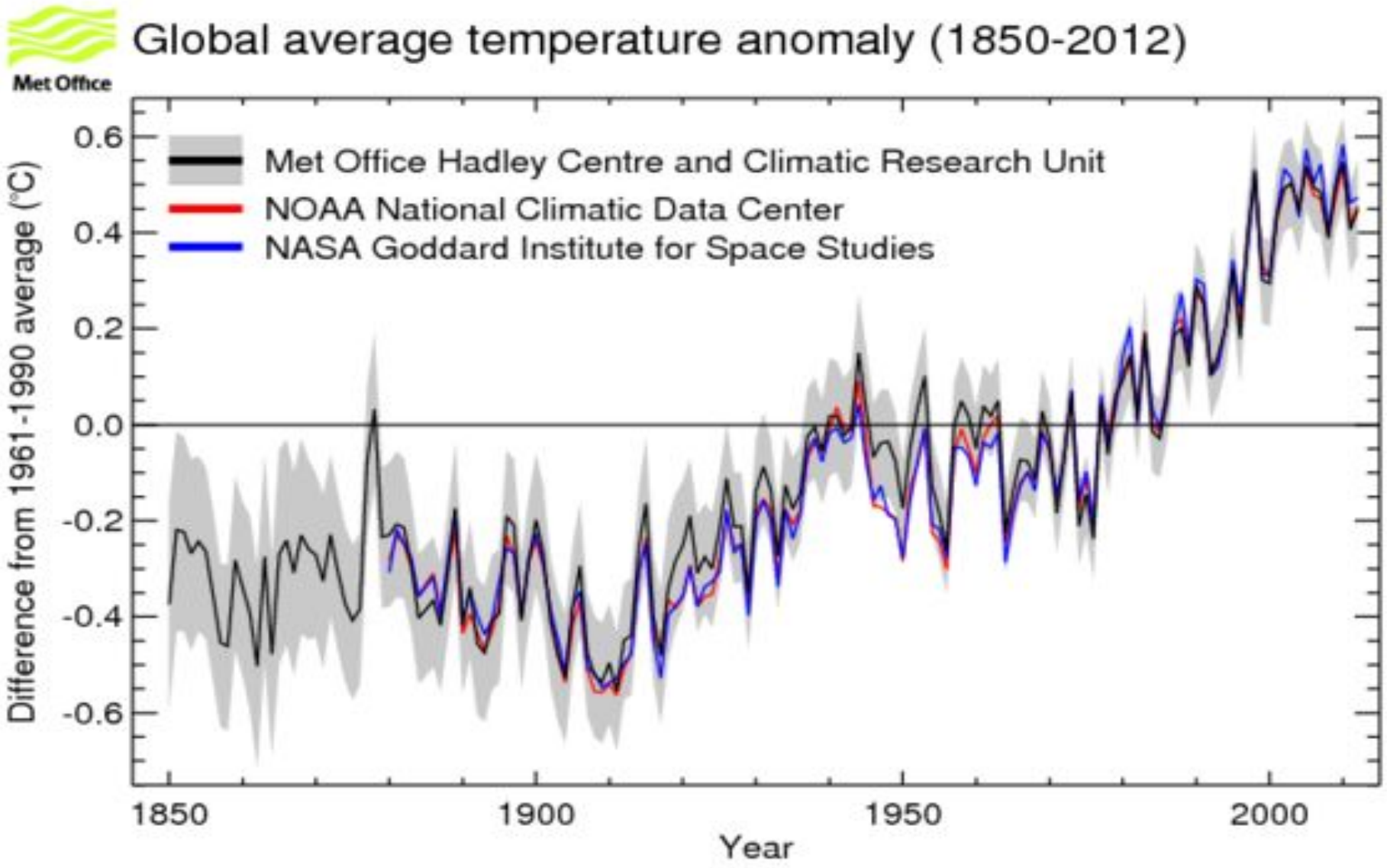
Napoli
9/12/2015

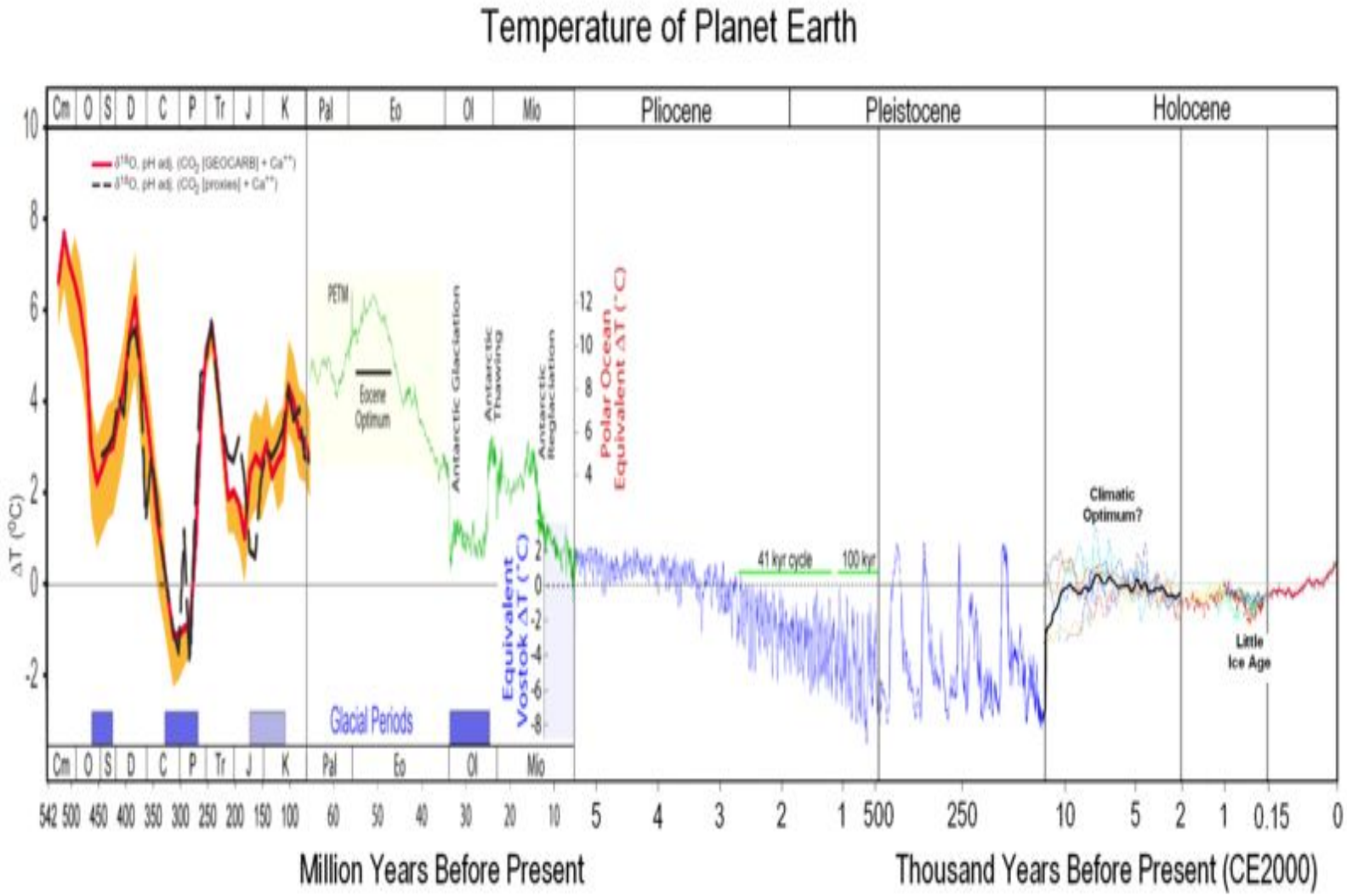
... e il contributo antropico

UNIVERSITÀ DEGLI STUDI DI NAPOLI
FEDERICO II

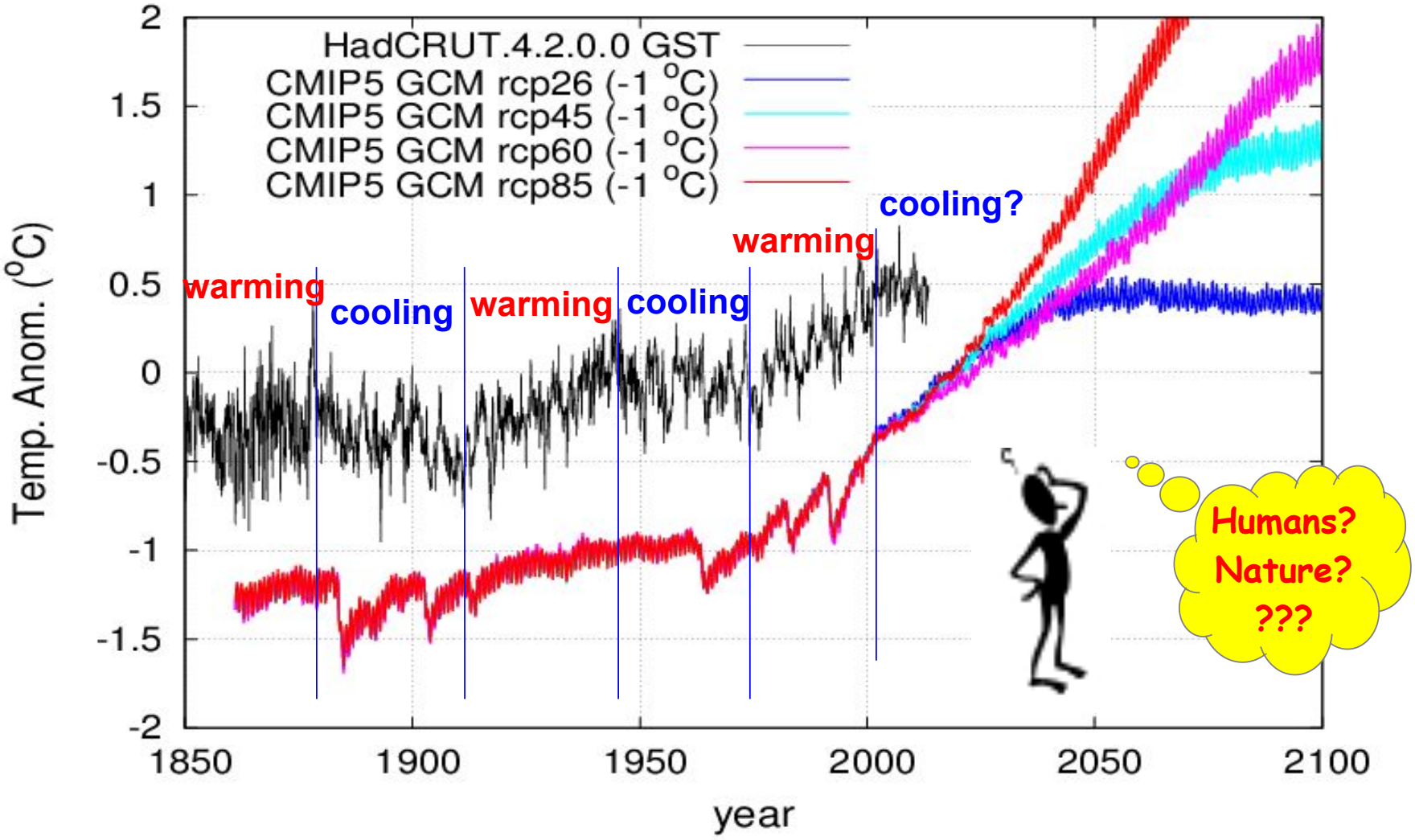
Il Riscaldamento globale!



Il clima della Terra e' sempre cambiato

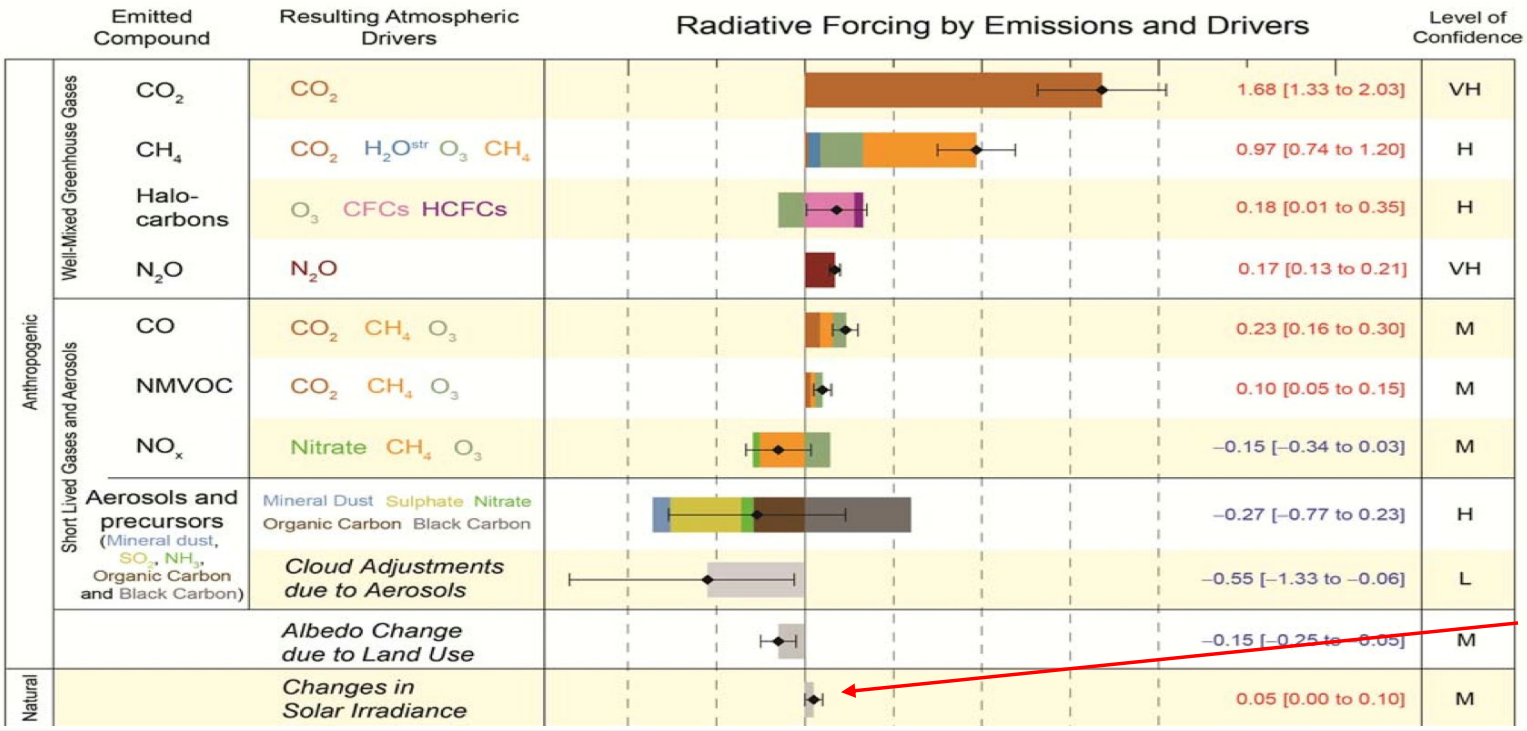


La temperatura della superficie (CRU) e i modelli CMIP5 (GCMs) dell'IPCC



Scafetta, N. 2013. Discussion on climate oscillations: CMIP5 general circulation models versus a semi-empirical harmonic model based on astronomical cycles.
Earth-Science Reviews 126, 321-357.

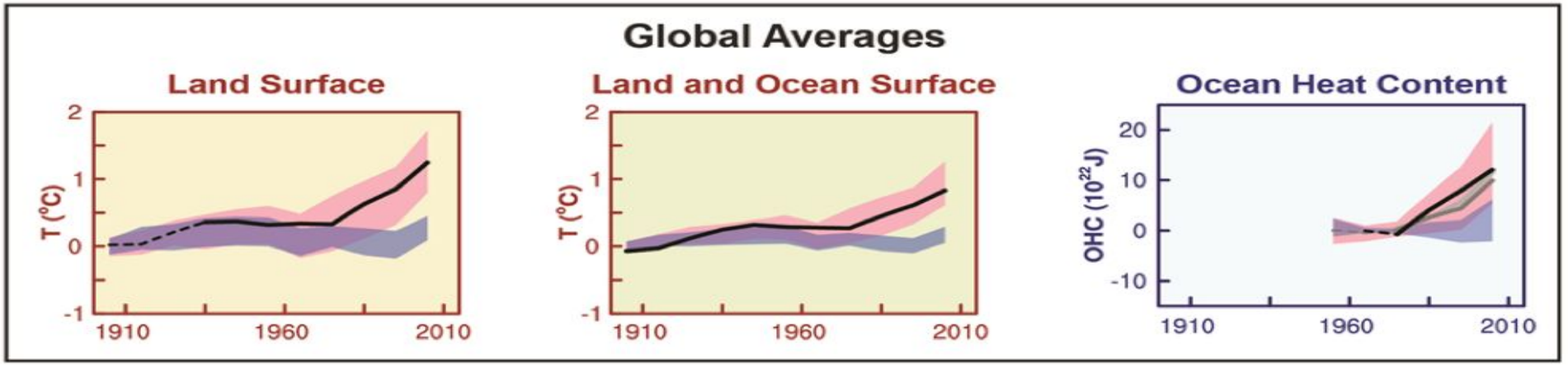
La teoria del riscaldamento globale



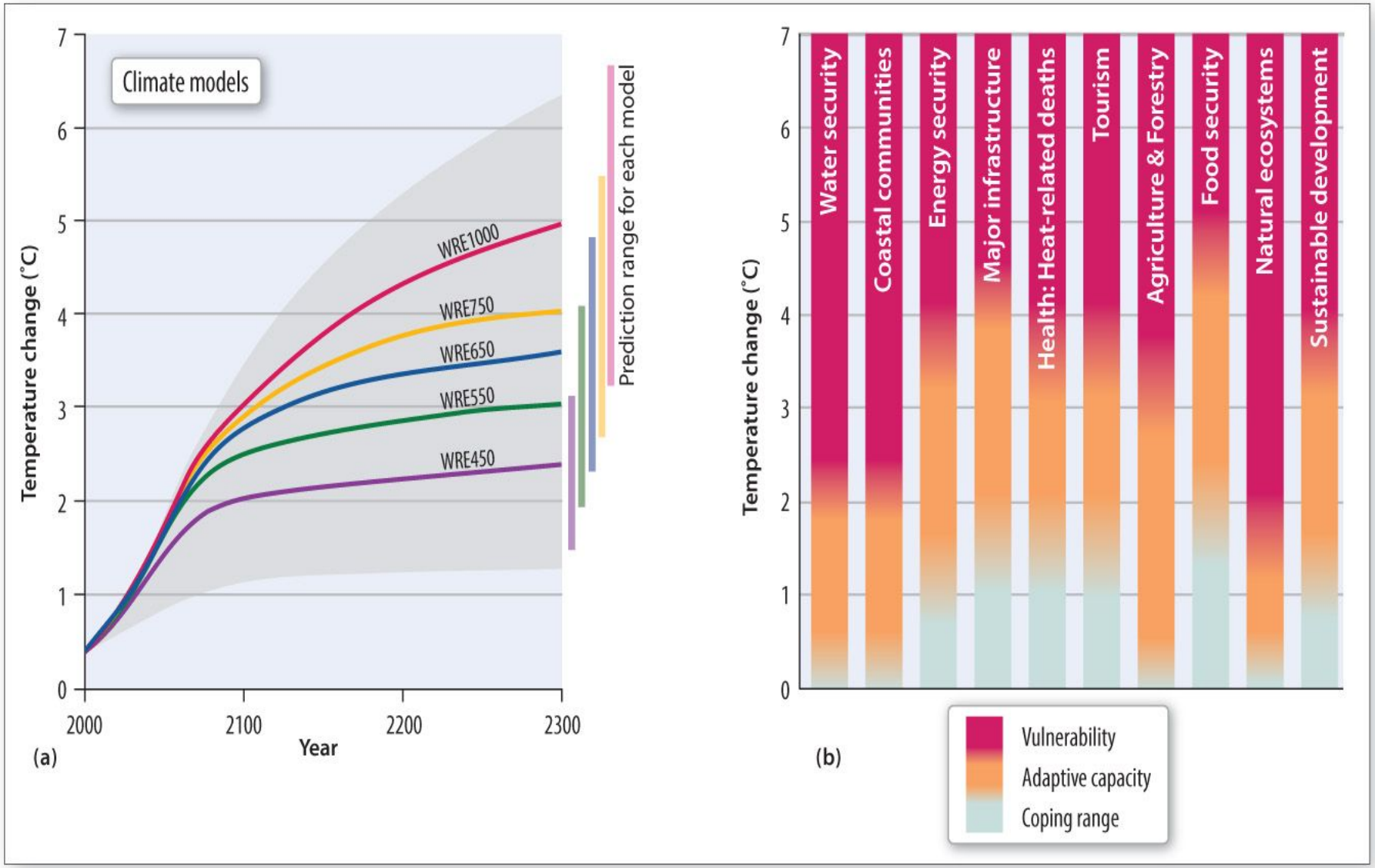
CMIP5 GCM Forcings:

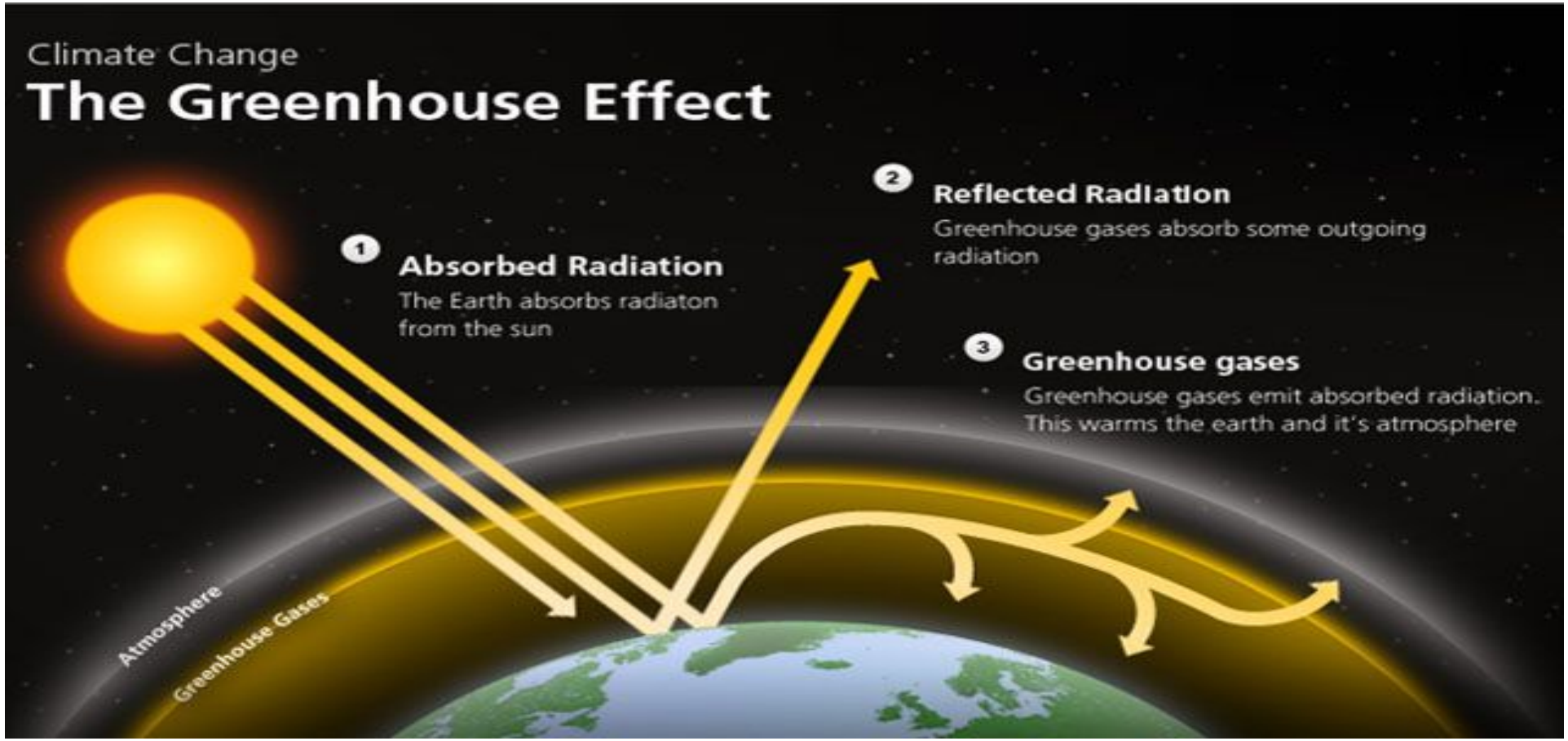
IPCC AR5, 2013

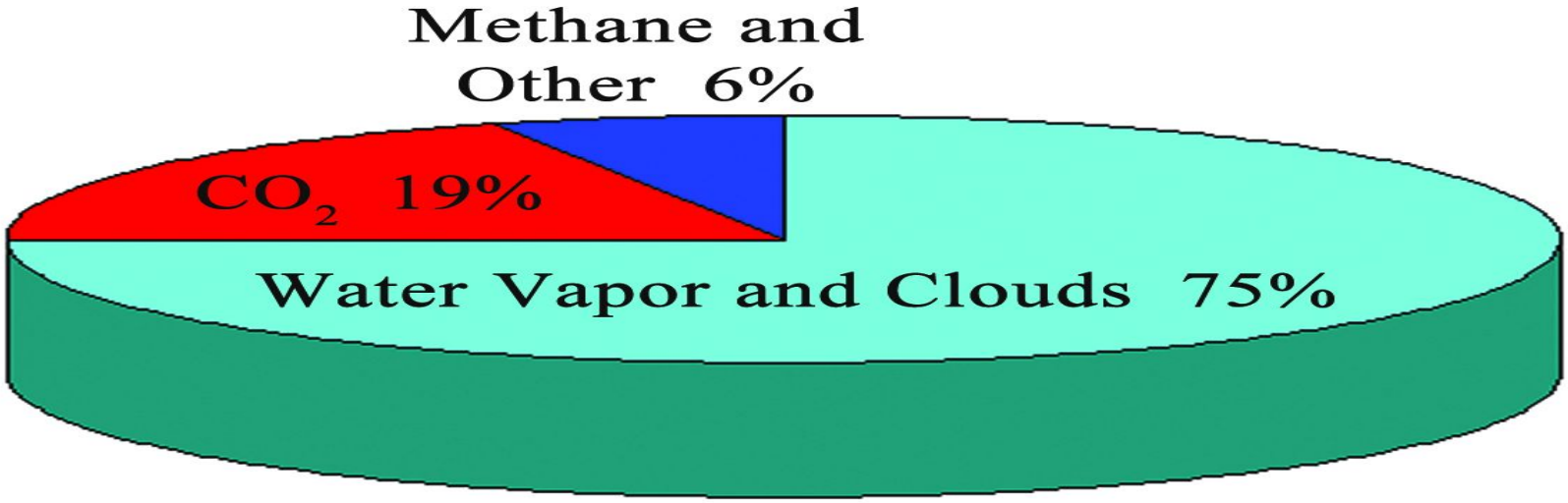
The Sun does not matter much!



Il pericolo del global warming: il limite dei 2 °C

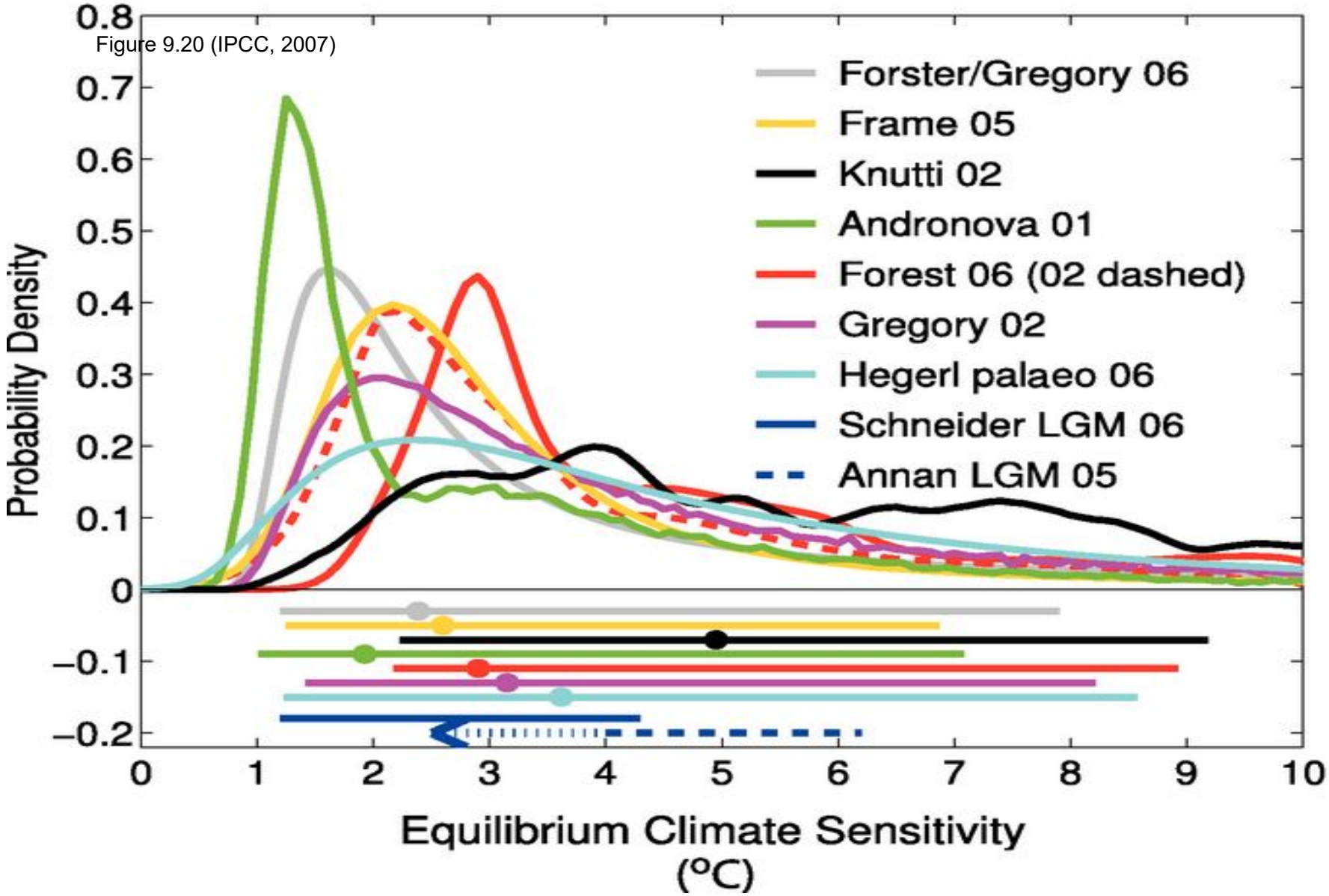



Climate Change
The Greenhouse Effect
1
Absorbed Radiation
The Earth absorbs radiaton from the sun
2
Reflected Radiation
Greenhouse gases absorb some outgoing radiation
3
Greenhouse gases
Greenhouse gases emit absorbed radiation. This warms the earth and it's atmosphere
Atmosphere
Greenhouse Gases


Methane and Other 6%
CO_2 19%
Water Vapor and Clouds 75%

L'incertezza nella sensibilita' climatica alla CO_2

Figure 9.20 (IPCC, 2007)



Il clima antico e la CO_2

Tipici fallimenti CMIP3/CMIP5 GCMs

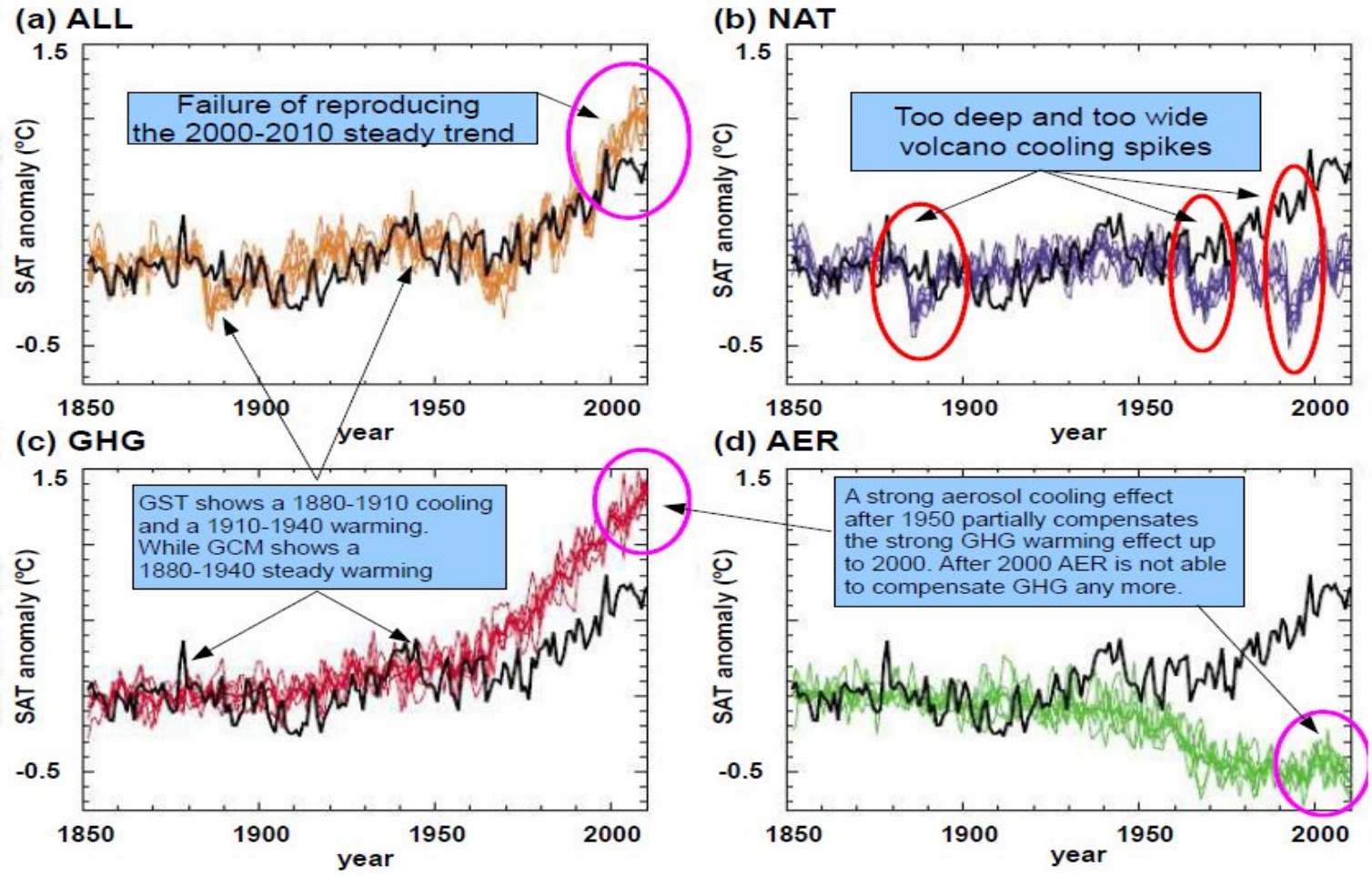
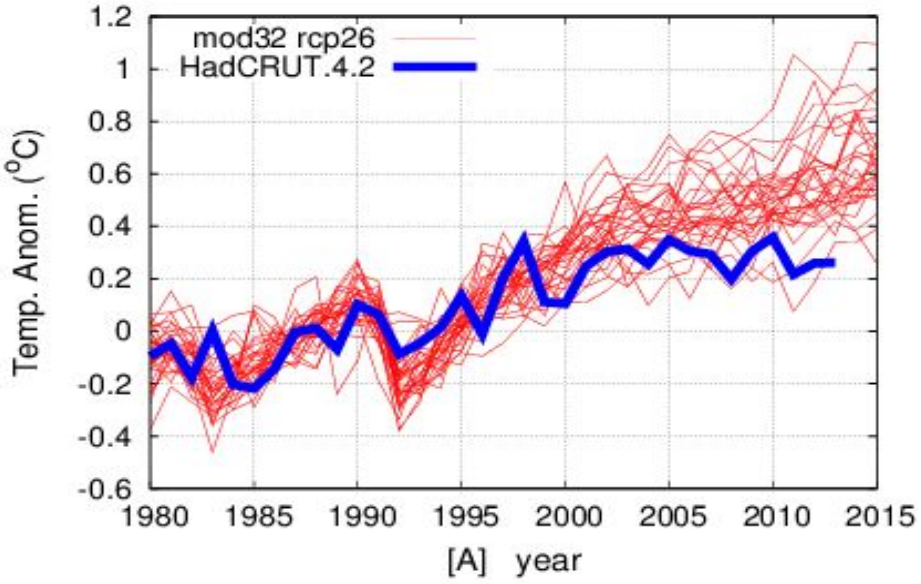
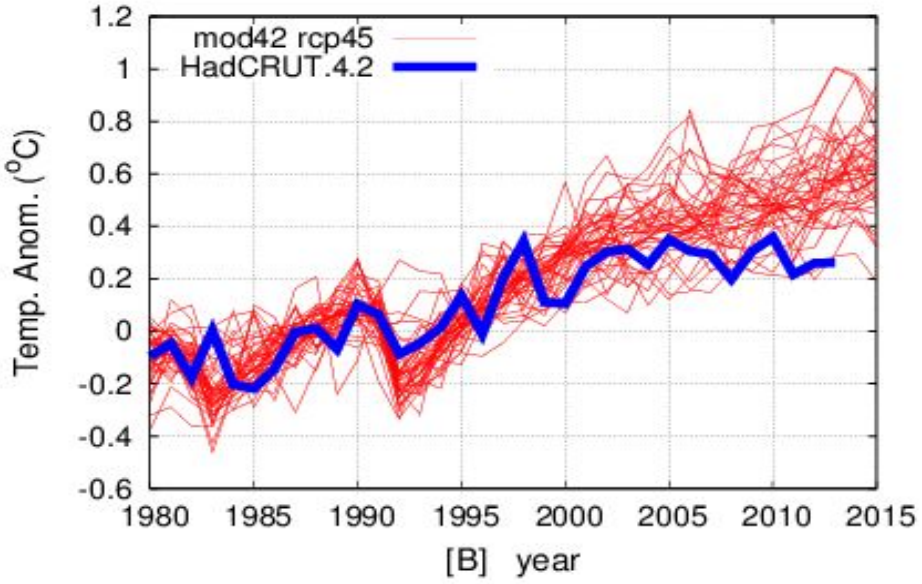


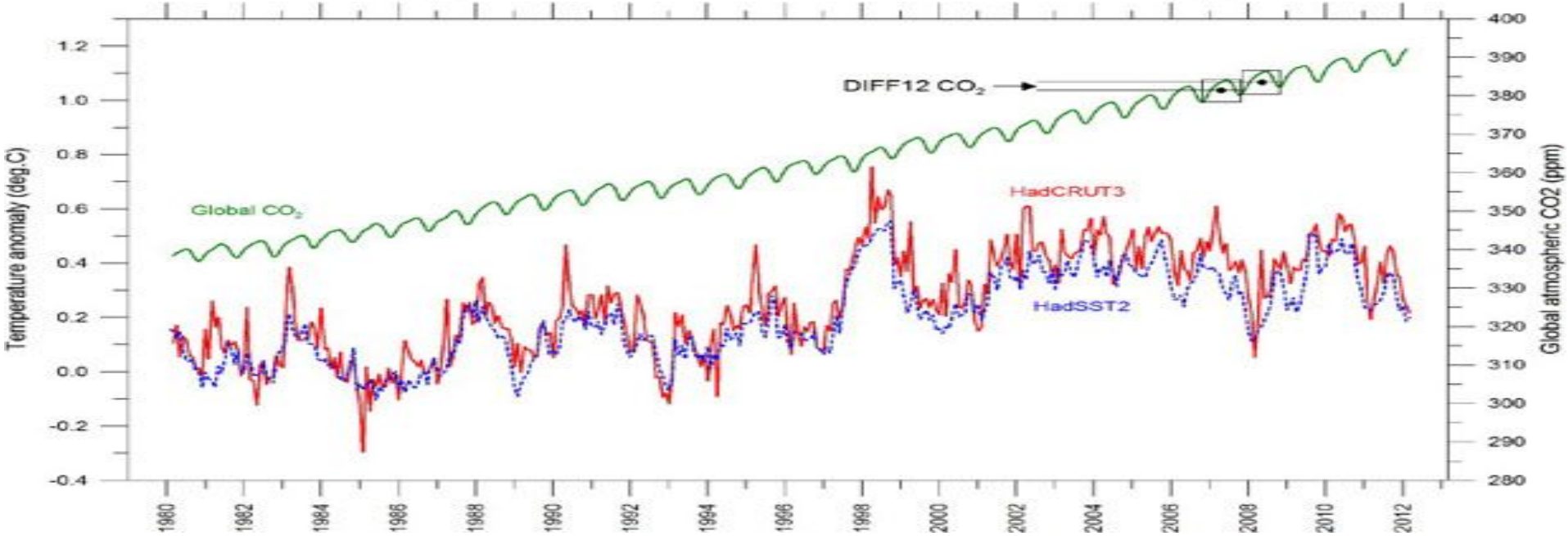
Figure 11: A reproduction of Figure 1 of Gillett et al. [88]. Comments in the diagrams highlight common problems inherent to all CMIP5 GCMs. Simulations were run with: (a) anthropogenic and natural forcings (ALL), (b) natural forcings only (NAT), (c) greenhouse gases only (GHG), and (d) aerosols only (AER).

Scafetta, N. 2013. Discussion on climate oscillations: CMIP5 general circulation models versus a semi-empirical harmonic model based on astronomical cycles. Earth-Science Reviews 126, 321-357.

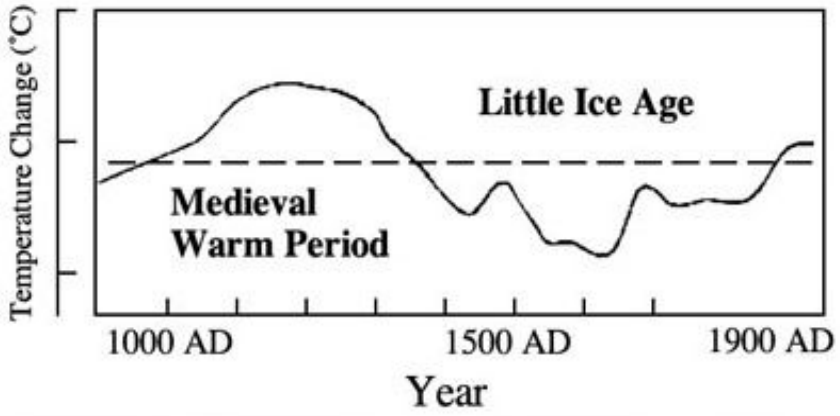
I modelli e la temperatura: la “pausa”



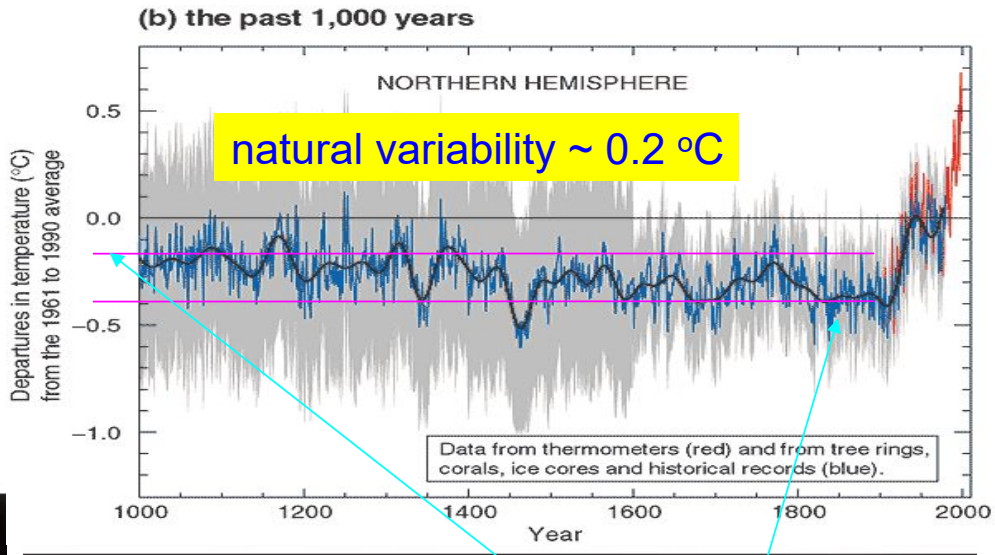




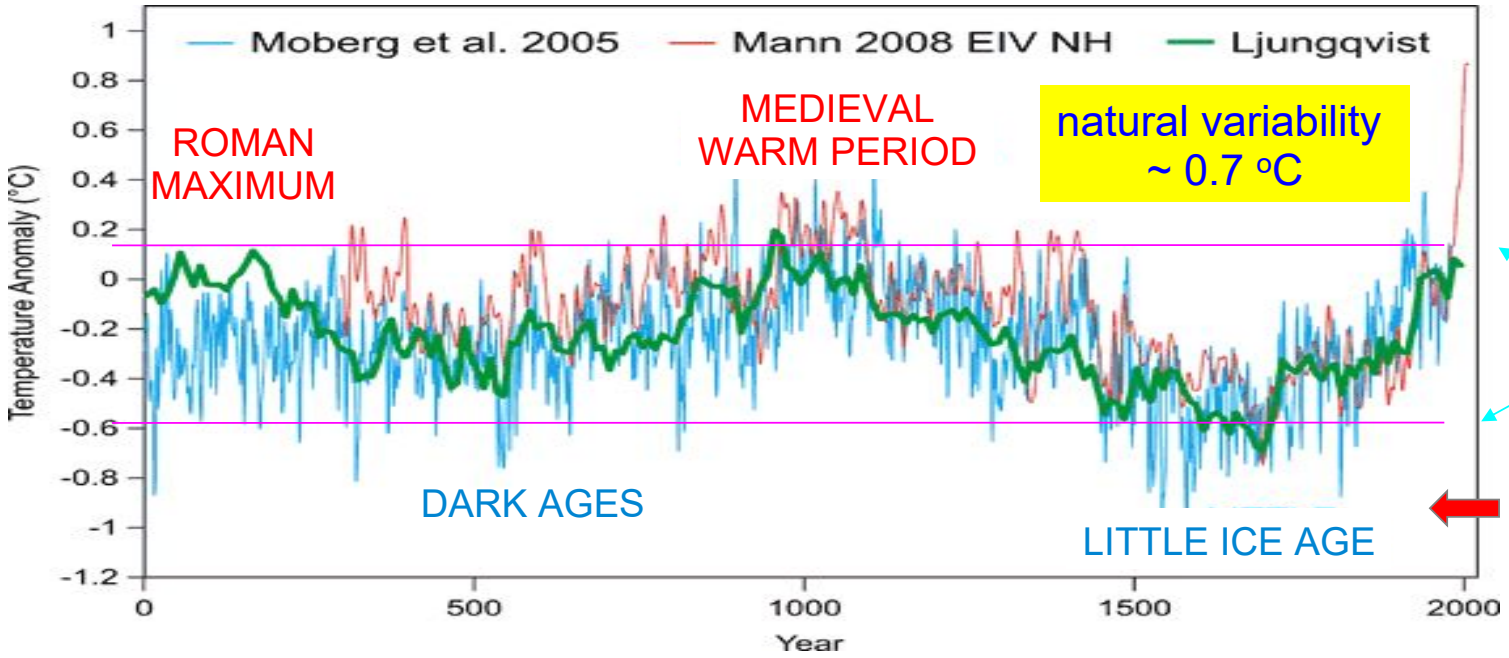
Capire le temperature paleoclimatiche: il grande ciclo



IPCC's depiction of the Medieval Warm Period from their 1995 Report



IPCC's depiction (from Mann) of the MWP as seen in their 2001 Report

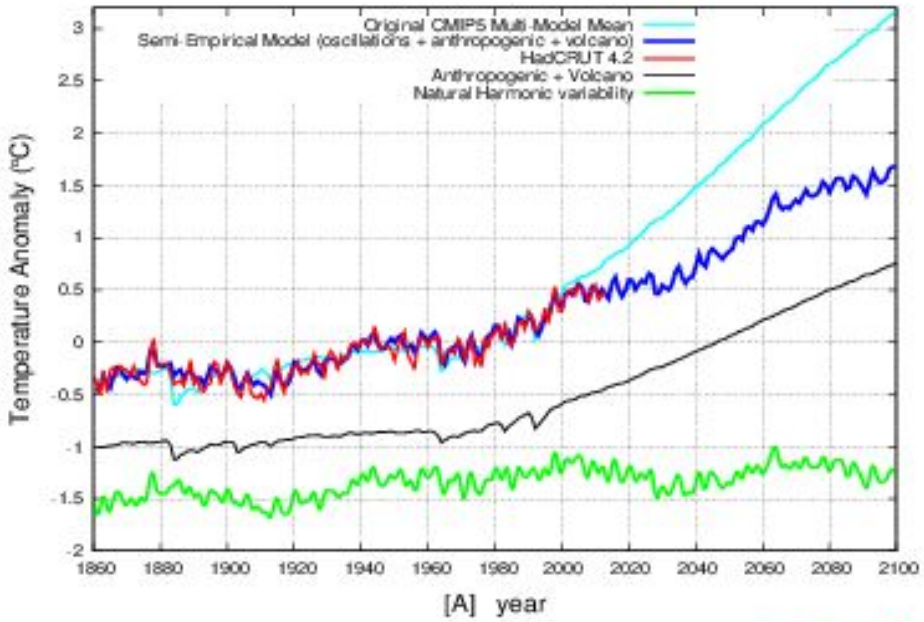


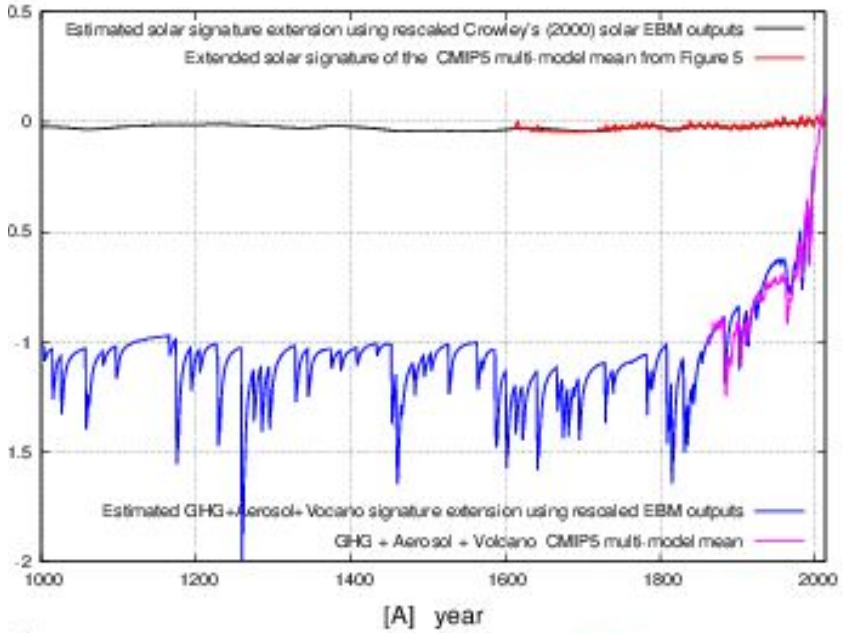
~ 0.2 °C

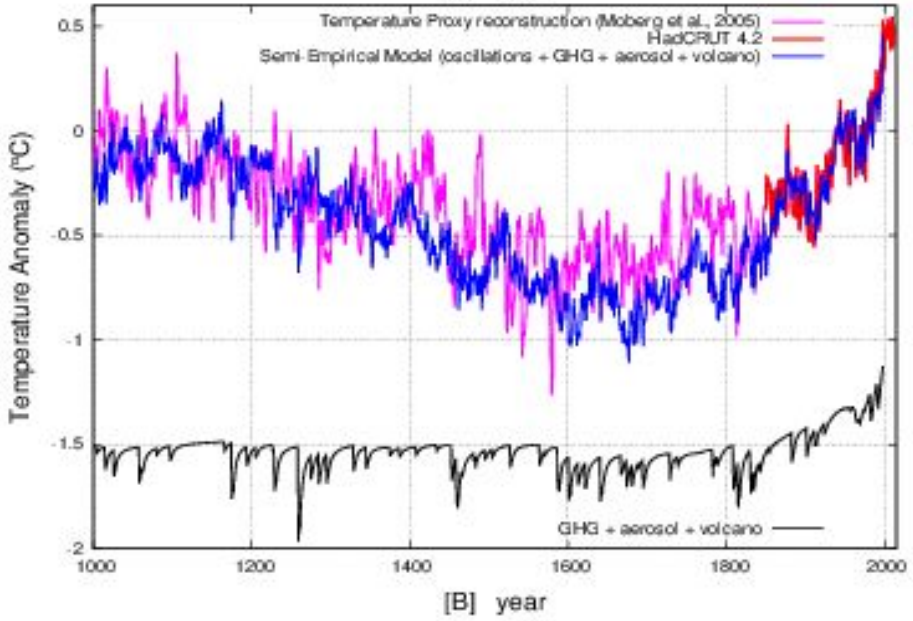
~ 0.7 °C

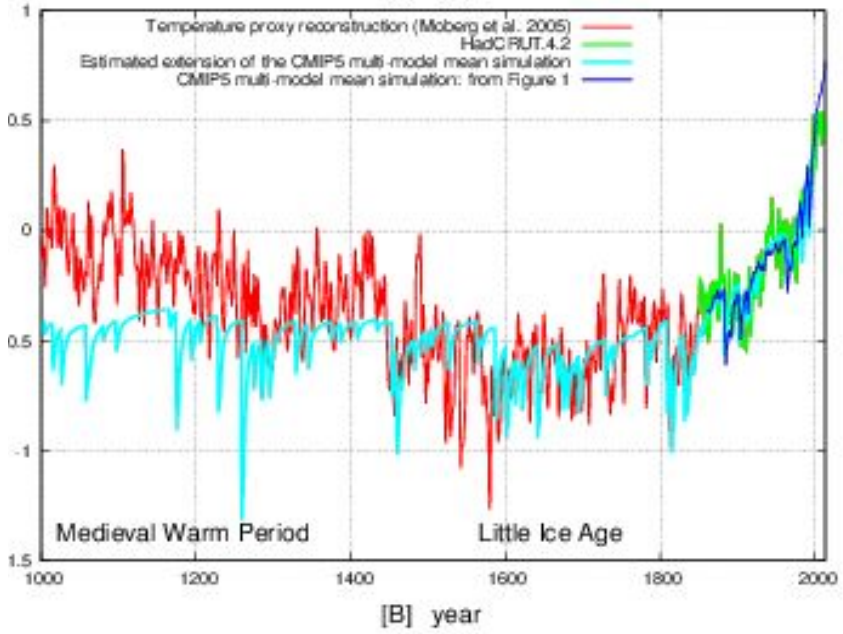
Modern GST reconstructions

capire il clima: ipotesi a confronto



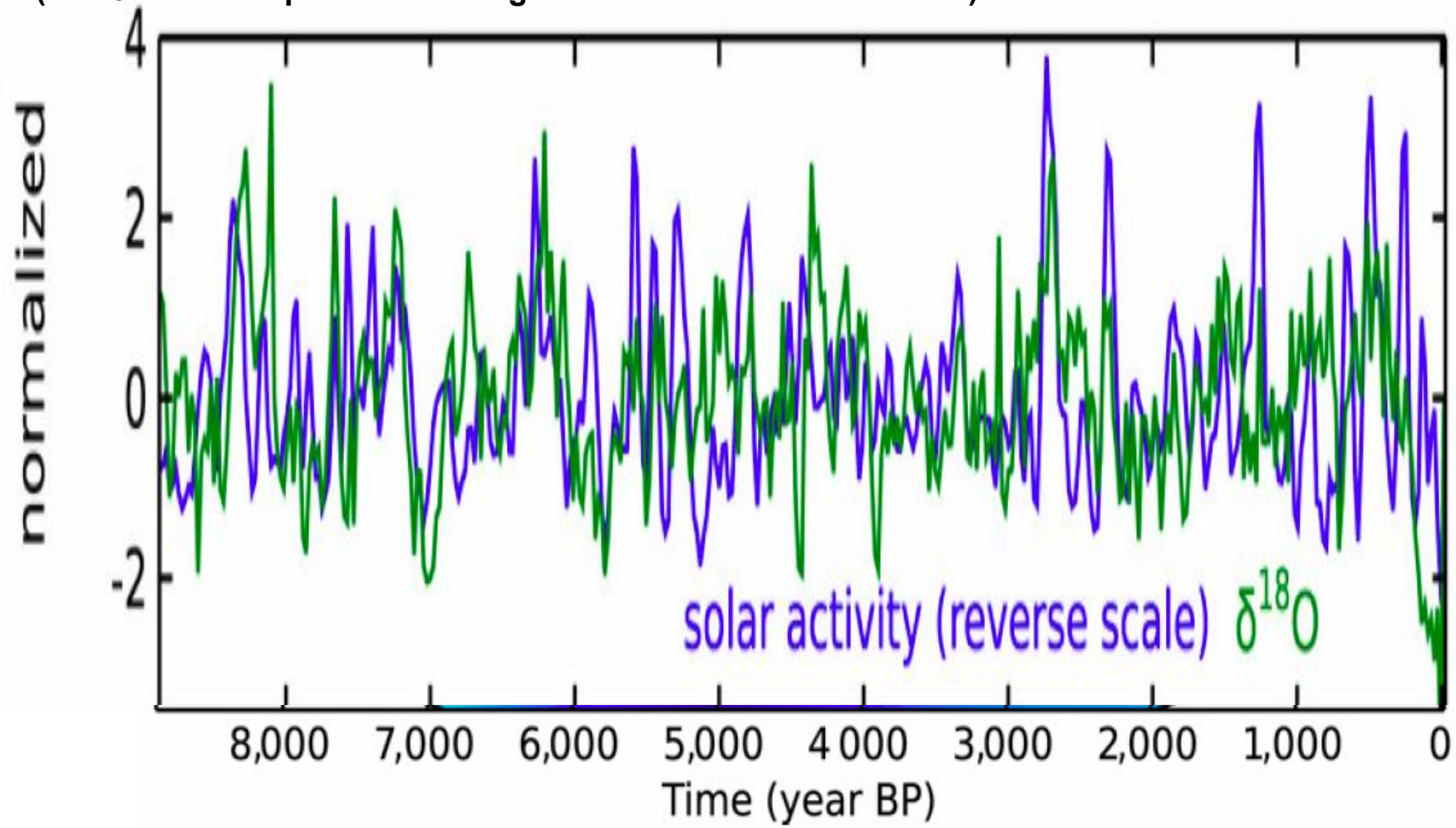






La temperatura vs. i records solari

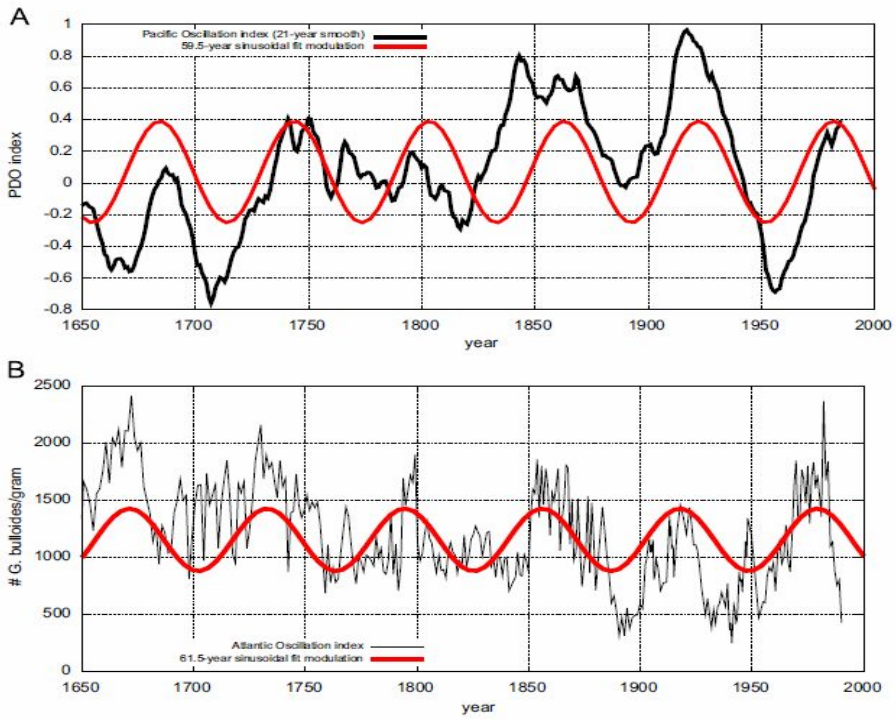
Comparison of solar activity (total solar irradiance [TSI]) in blue and $\delta^{18}O$ from Dongge cave, China, in green representing changes of the Asian climate. Possibly the Asian monsoon (AM) (low $\delta^{18}O$ corresponds to strong AM monsoon and vice versa).



Steinhilber F et al. PNAS 2012;109:5967-5971

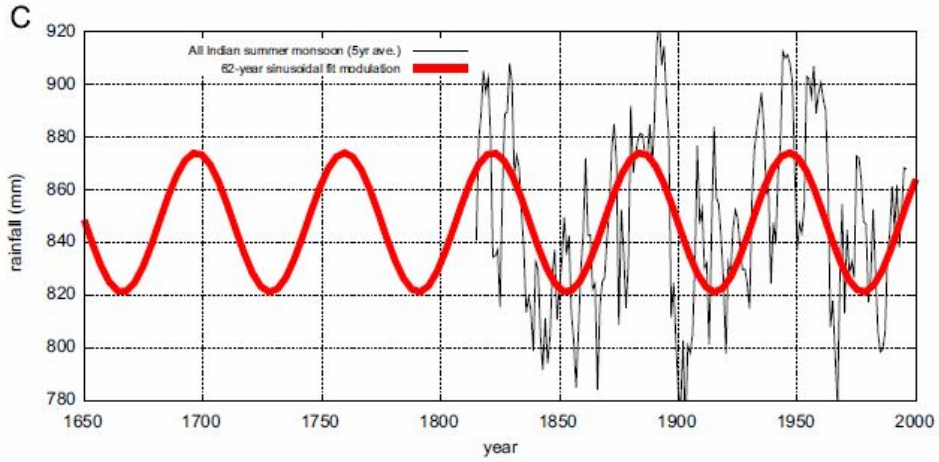
Un ciclo di 60 anni nel clima

pacific decadal oscillation

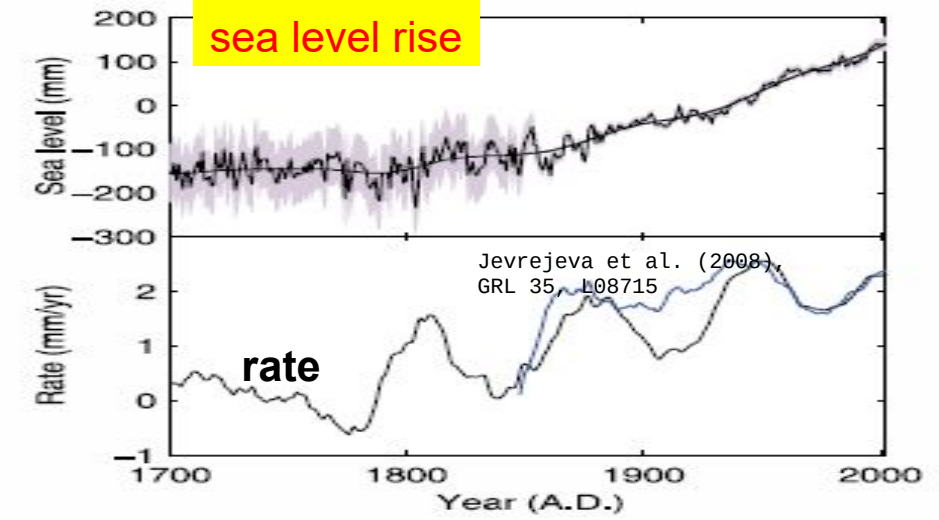


atlantic multidecadal oscillation

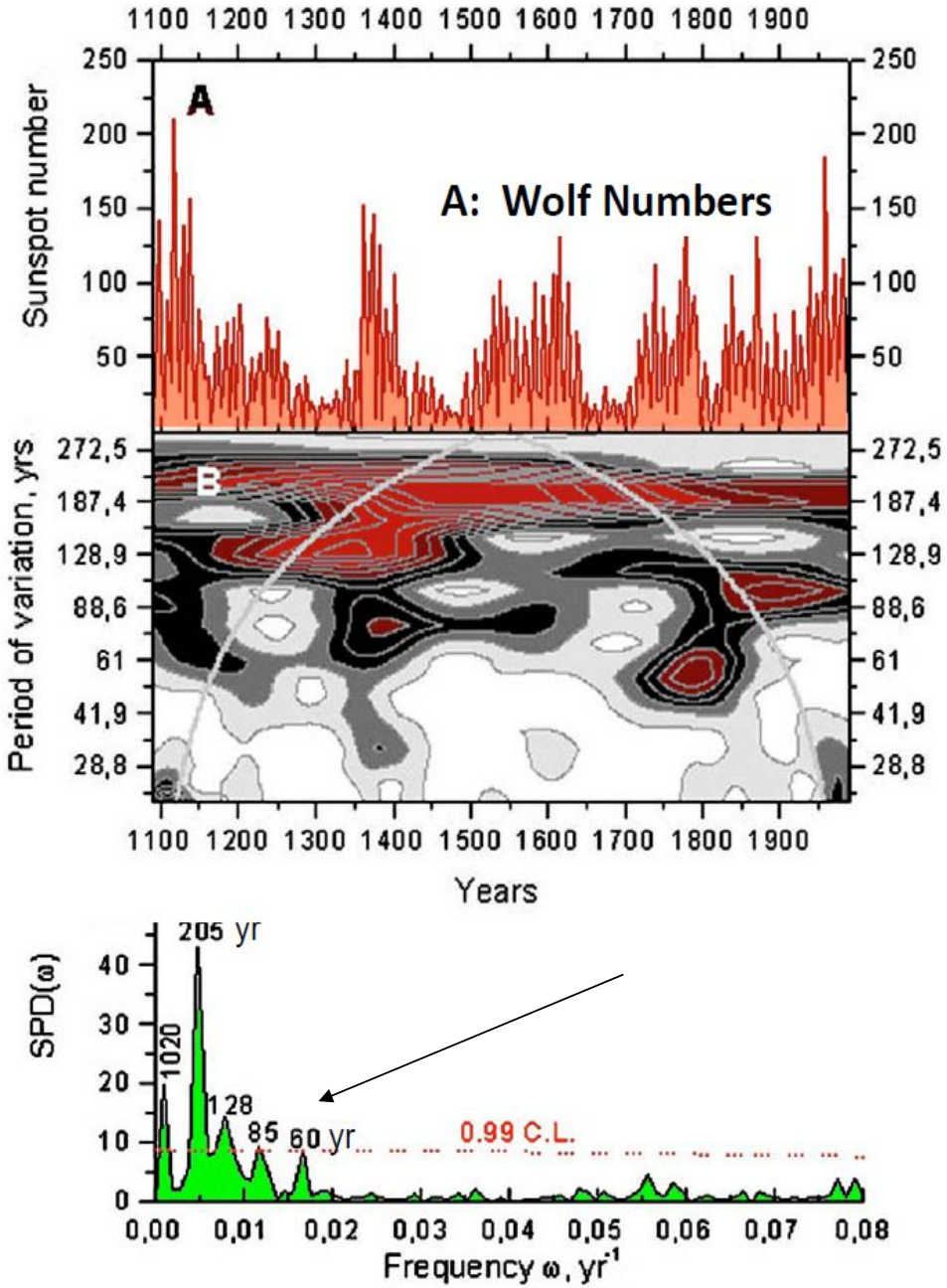
moonsoon



sea level rise



Scafetta N., 2012. A shared frequency set between the historical mid-latitude aurora records and the global surface temperature. Journal of Atmospheric and Solar-Terrestrial Physics 74, 145-163.



Solar Cycles

Wolf Numbers reconstructed by Nagovitsyn (1997) using data by Schove (1979).
After 1700 AD direct Zürich data.

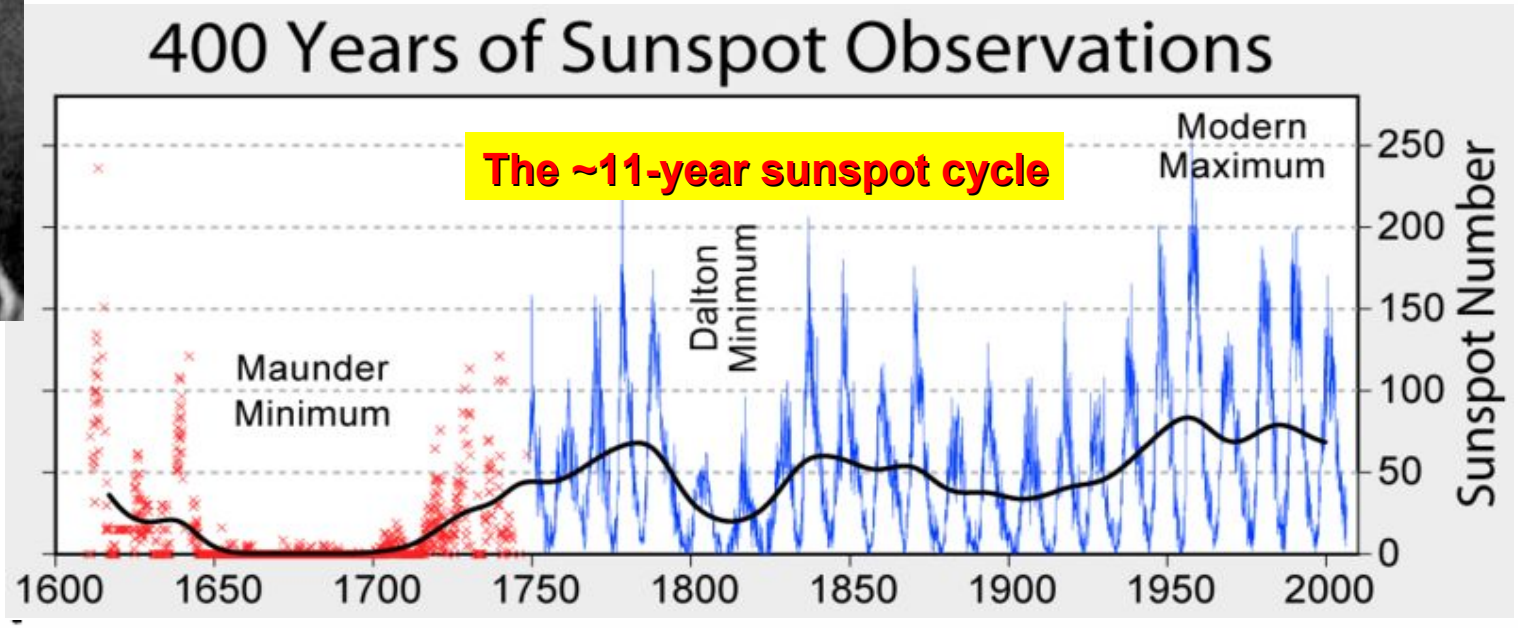
Local wavelet (Morlet basis) **spectrum of Wolf Numbers** reconstructed by Nagovitsyn. White domains – local wavelet power <0.2; black domains – local wavelet power >1.0 (0.99 c.l.).

Fourier Spectrum Density of Wolf Numbers reconstructed by Nagovitsyn. Dotted line: 0.99 c.l. (red noise factor 0.3).
Significant cycles at 60, 85, 128, 205 yr.
Ogurtsov et al., Solar Physics, 2002

La teoria planetaria della variazione solare

Extract of a Letter from Prof. R. Wolf, of Zurich, to Mr. Carrington, dated Jan. 12, 1859.

(*Translation.*)



the same planets, the conclusion seems to be inevitable, that my conjecture that the variations of spot-frequency depend on the influences of *Venus, Earth, Jupiter, and Saturn,* will not prove to be wholly unfounded. The preponderating planet

Le tre frequenze del ciclo di 11 anni del sole

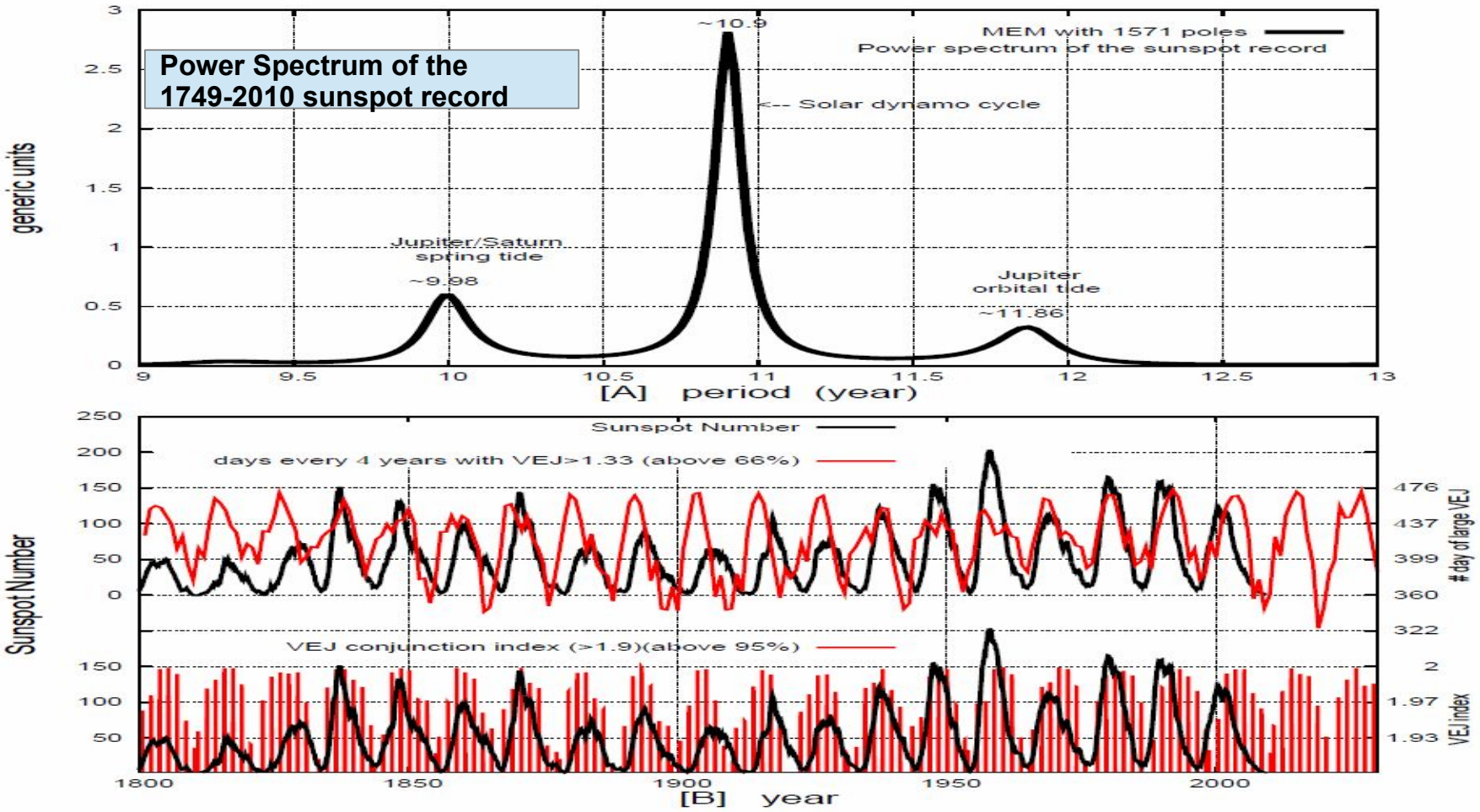
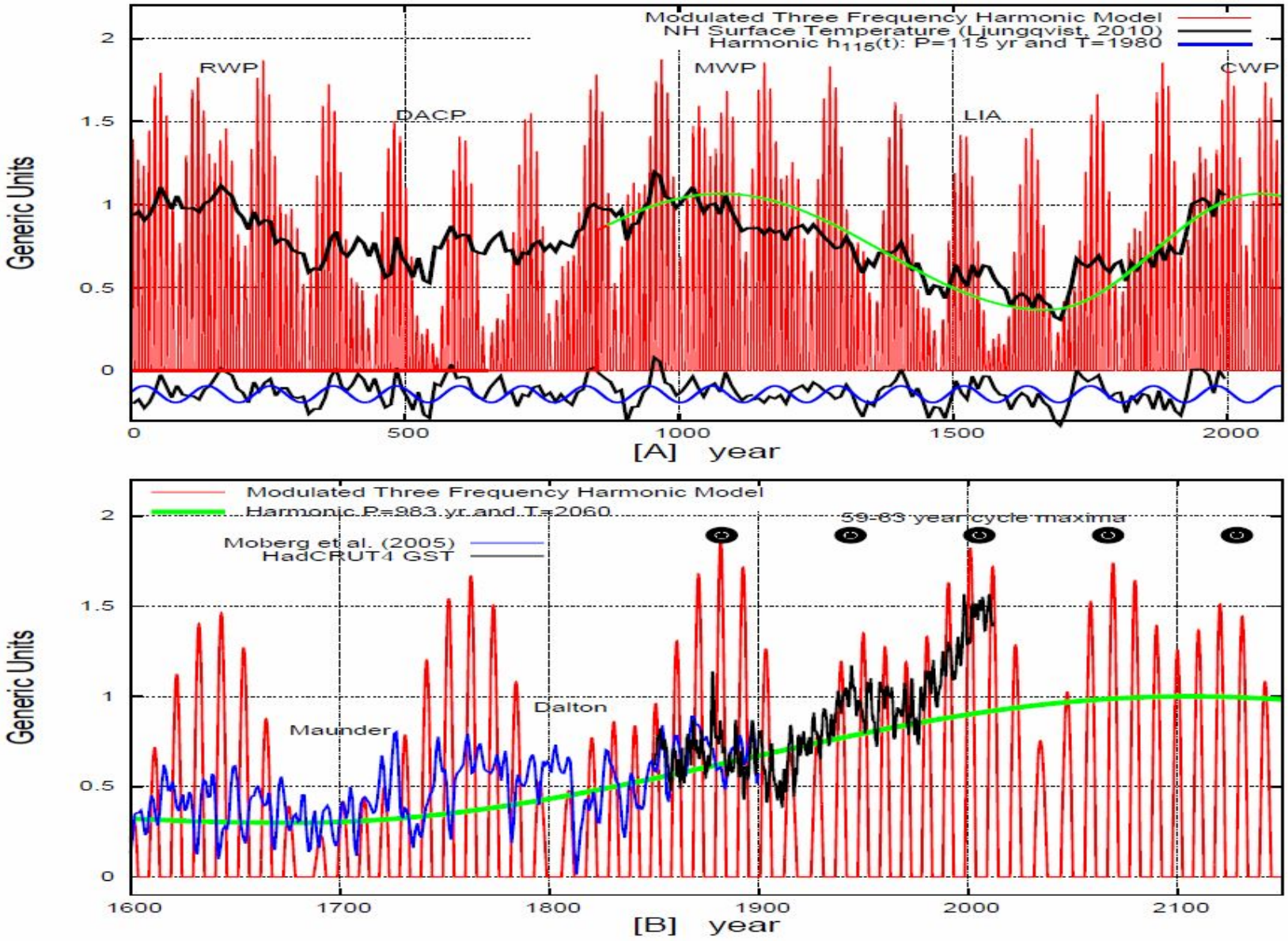


Figure 12: [A] Power spectrum of the sunspot record from 1749 to 2010 highlighting three peaks within the Schwabe frequency band (period 9-13 years) including the two major tides of Jupiter and Saturn. [B] Comparison between the sunspot record (black) and a particular tidal pattern configuration (red) made using Venus, Earth and Jupiter that reproduces on average the solar cycle length of 11.08 yr.

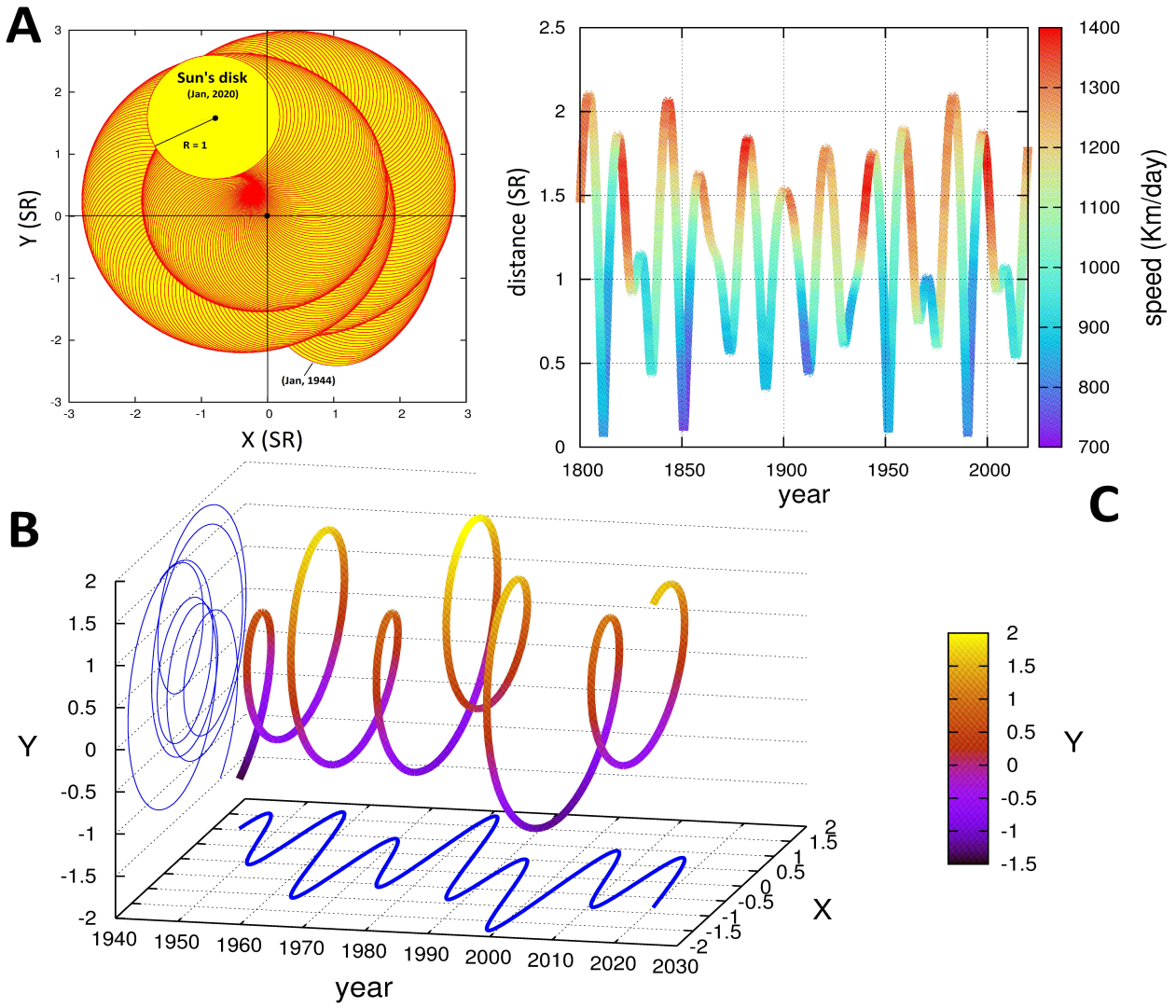
Scafetta N., 2012. Does the Sun work as a nuclear fusion amplifier of planetary tidal forcing? A proposal for a physical mechanism based on the mass-luminosity relation. Journal of Atmospheric and Solar-Terrestrial Physics 81-82, 27-40.

Il modello armonico del sole vs. la temperature ricostruite: cicli dedotti ~61, ~115, ~980 anni



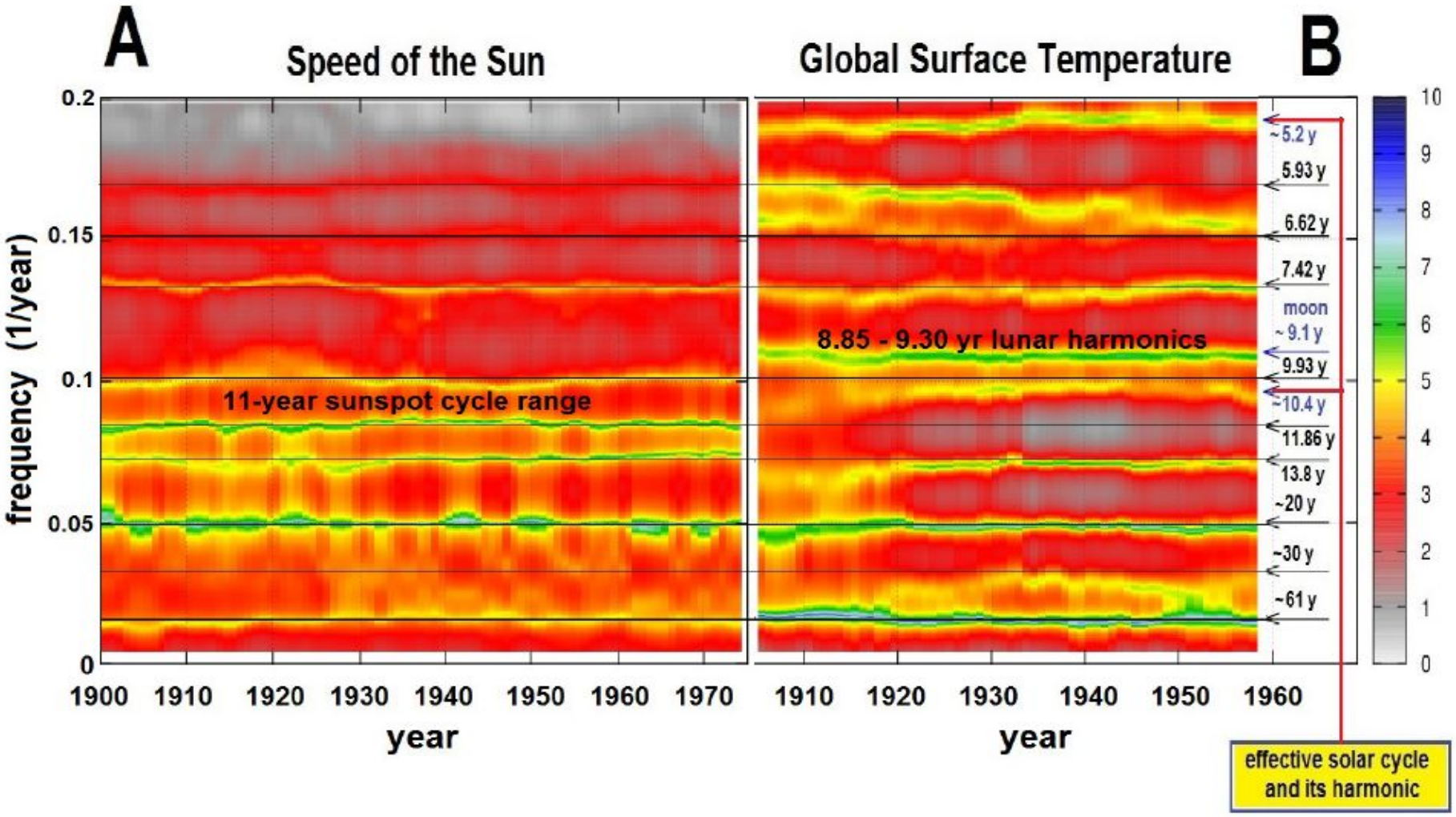
Scafetta N., 2012. Multi-scale harmonic model for solar and climate cyclical variation throughout the Holocene based on Jupiter-Saturn tidal frequencies plus the 11-year solar dynamo cycle. Journal of Atmospheric and Solar-Terrestrial Physics 80, 296-311.

Il movimento del sole



Scafetta, N., 2014. The complex planetary synchronization structure of the solar system.Pattern Recognition in Physics 2, 1-19.

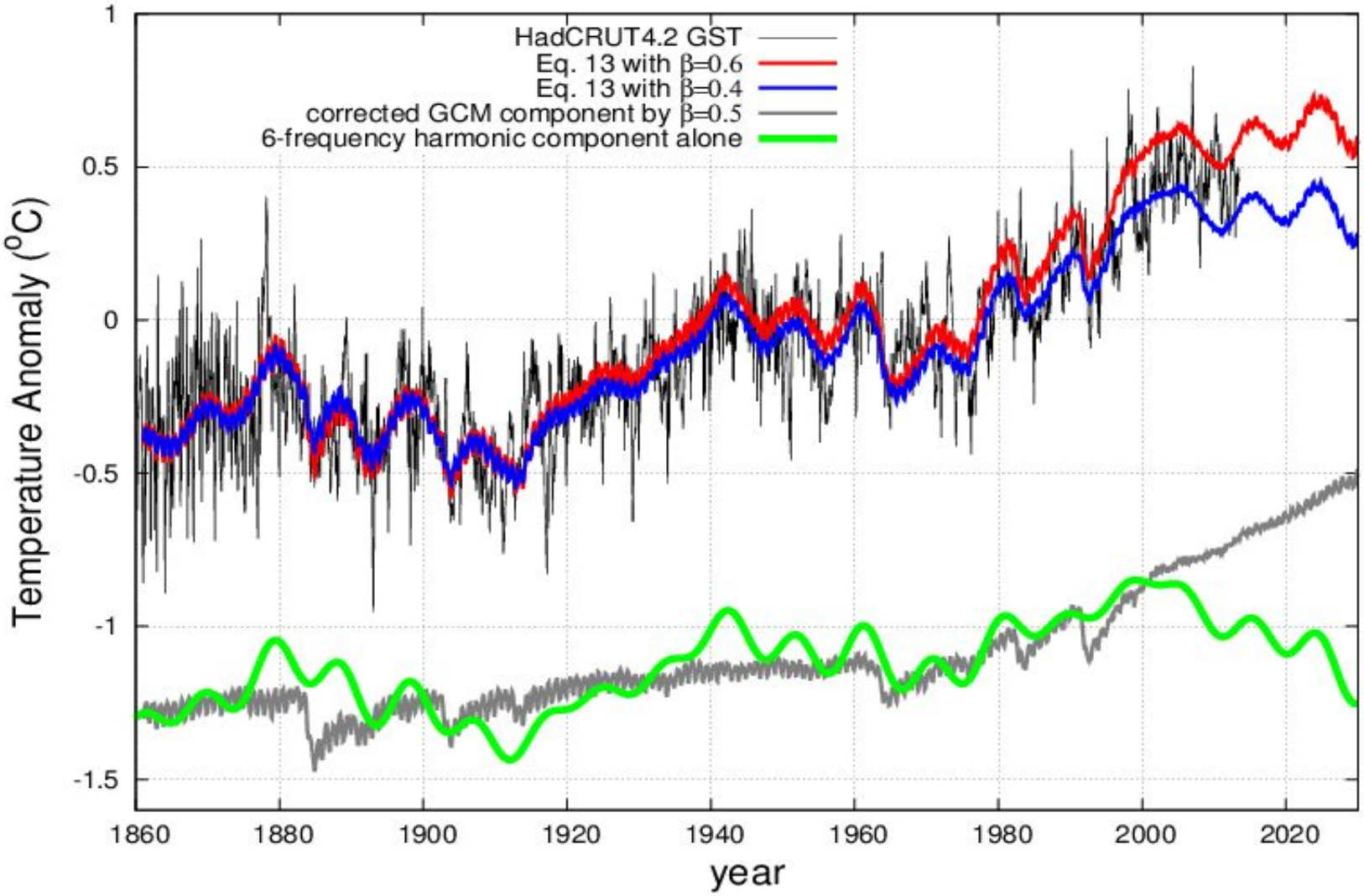
Confronto spettrale
il movimento del sole e la temperatura



cf.: Scafetta, N., 2014. Discussion on the spectral coherence between planetary, solar and climate oscillations: a reply to some critiques. Astrophysics and Space Science 354, 275-299. Scafetta N., 2010. Empirical evidence for a celestial origin of the climate oscillations and its implications. Journal of Atmospheric and Solar-Terrestrial Physics 72, 951-970.

Six-frequency astronomical model + corrected GHG-Aerosol-Volcano

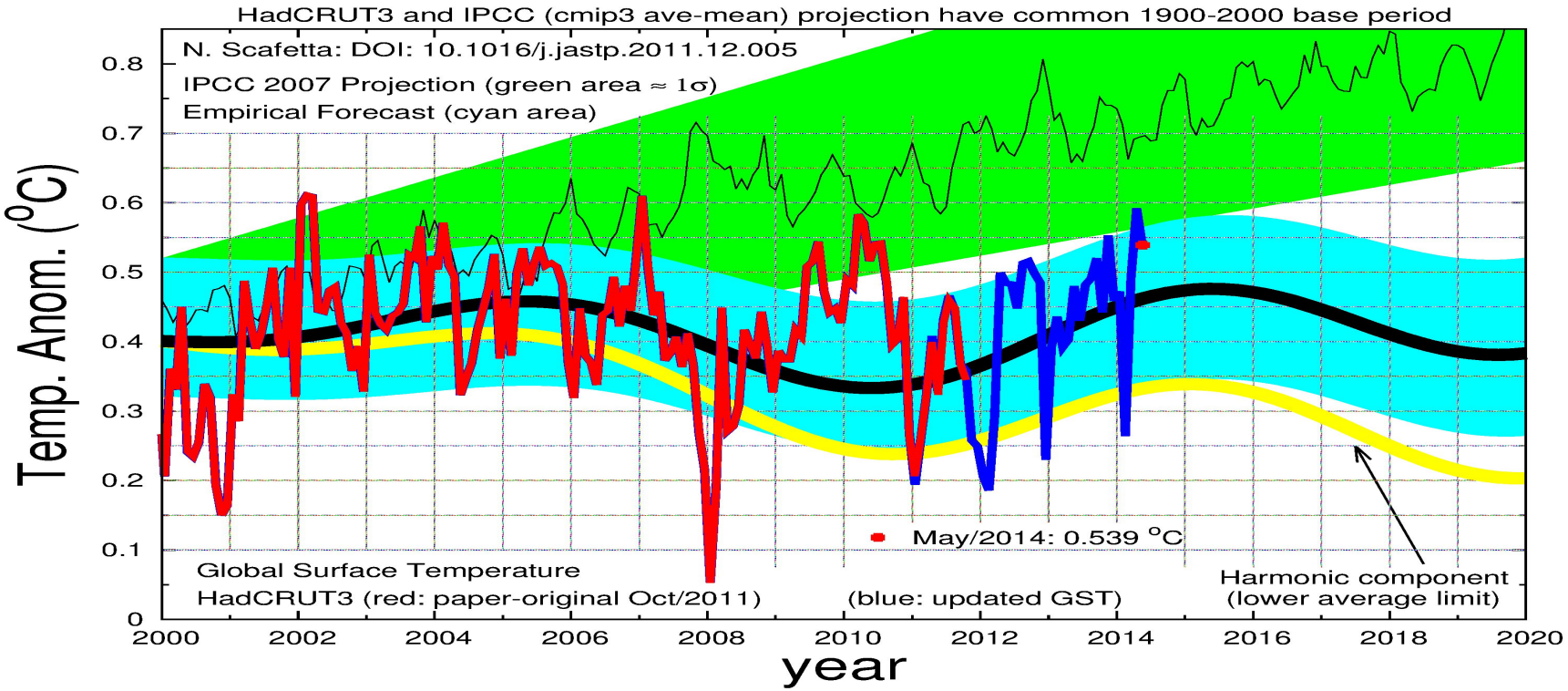
$$H(t) = h_{983}(t) + h_{115}(t) + h_{60}(t) + h_{20}(t) + h_{10.4}(t) + h_{9.1}(t) + \beta * m(t) + const,$$



Scafetta, N. 2013. Discussion on climate oscillations: CMIP5 general circulation models versus a semi-empirical harmonic model based on astronomical cycles. Earth-Science Reviews 126, 321-357.

Astronomical Climate model forecast vs. CMIP3 GCM (IPCC 2007)

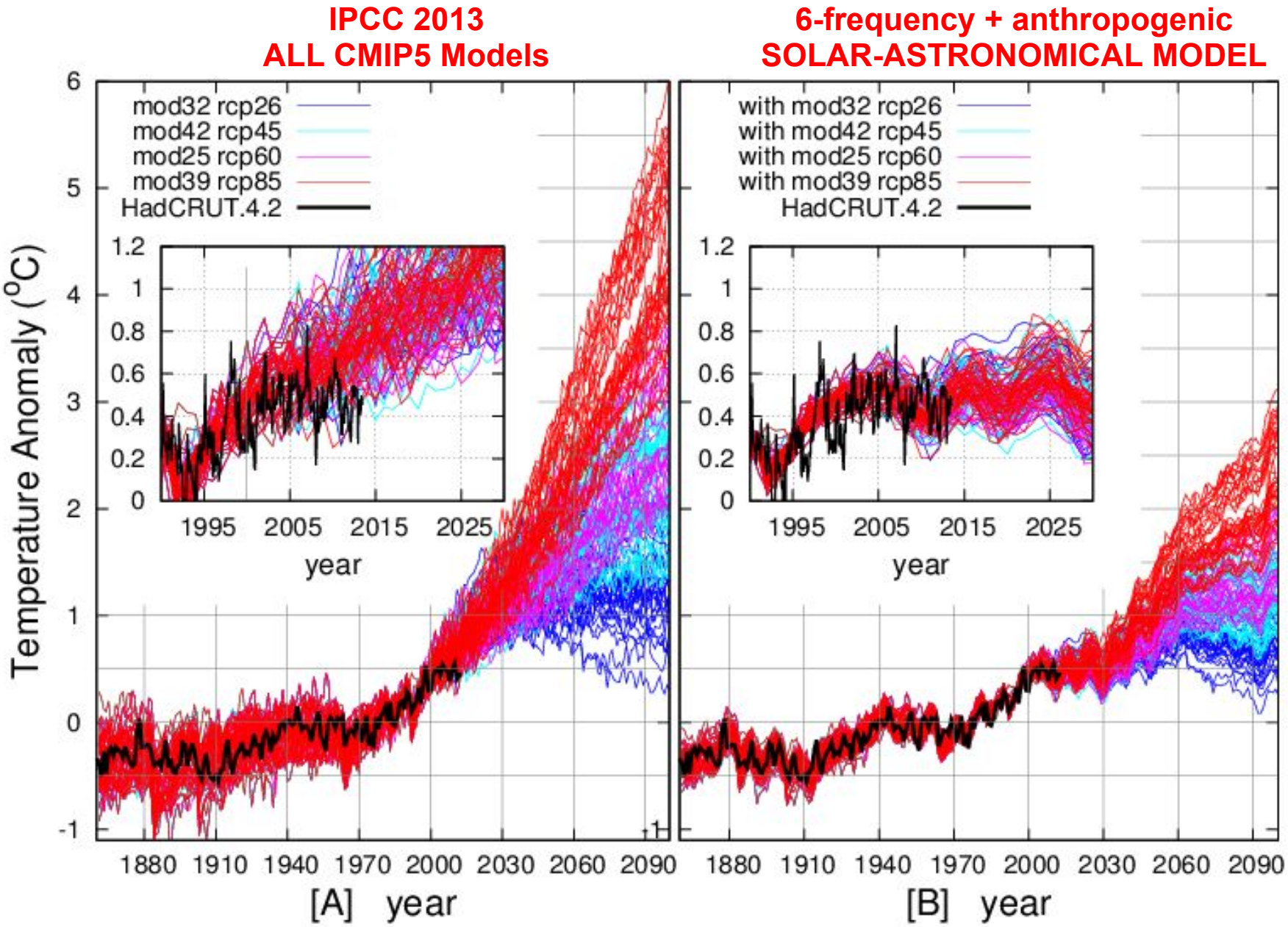
Visit http://people.duke.edu/~ns2002/



Global surface temperature (HadCRUT3): original global surface temperature record **(red)** published in Scafetta JASTP 2012b; and updated global surface temperature **(blue)**.

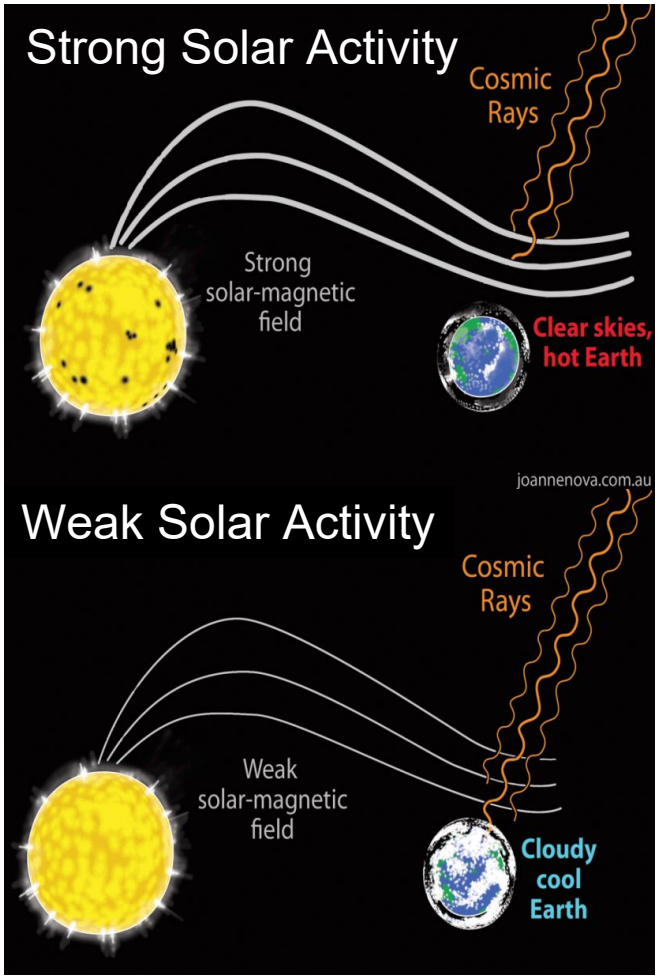
The **back** curve within the **cyan area** is the full astronomical harmonic model forecast since 2000 that clearly outperforms the IPCC general circulation model projections **(green area)**.

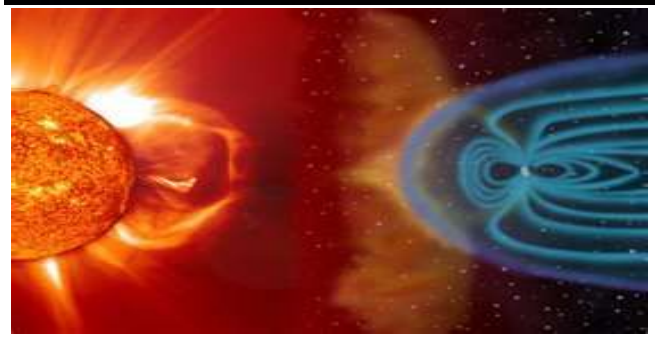
The yellow curve is the harmonic component alone without the anthropogenic component.



Scafetta, N. 2013. Discussion on climate oscillations: CMIP5 general circulation models versus a semi-empirical harmonic model based on astronomical cycles. Earth-Science Reviews 126, 321-357.

I raggi cosmici, il circuito elettrico dell'atmosfera e le nuvole





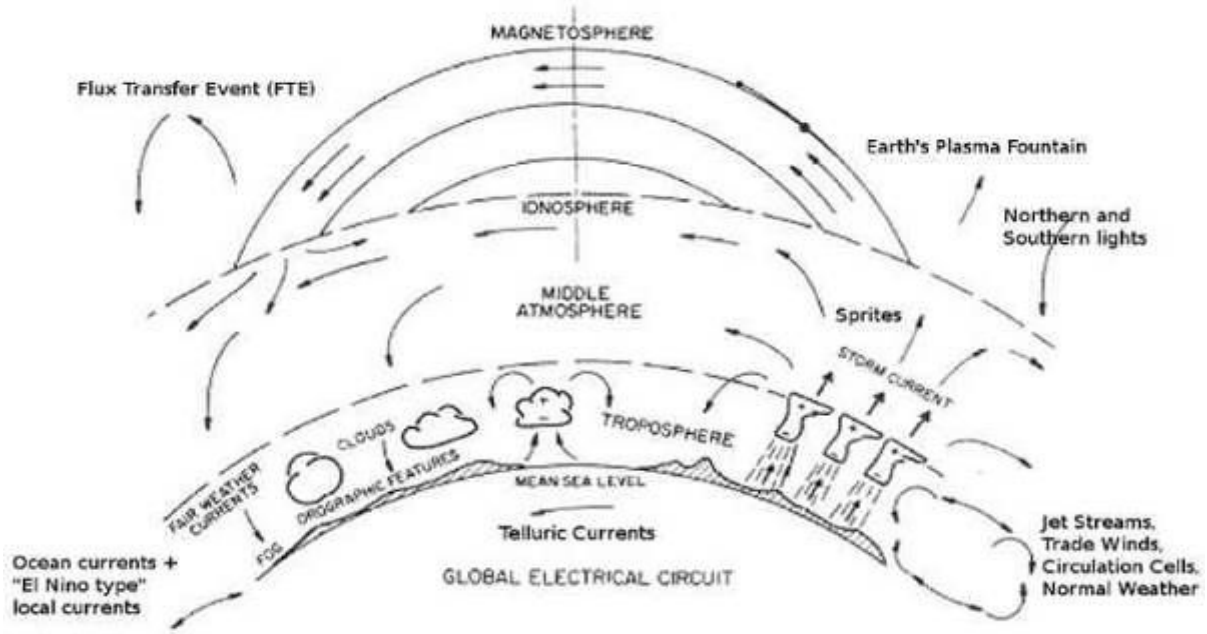
1) Strong solar activity results in strong solar magnetic field.

2) The stronger the solar magnetic field, the better the earth is protected from incoming cosmic rays.

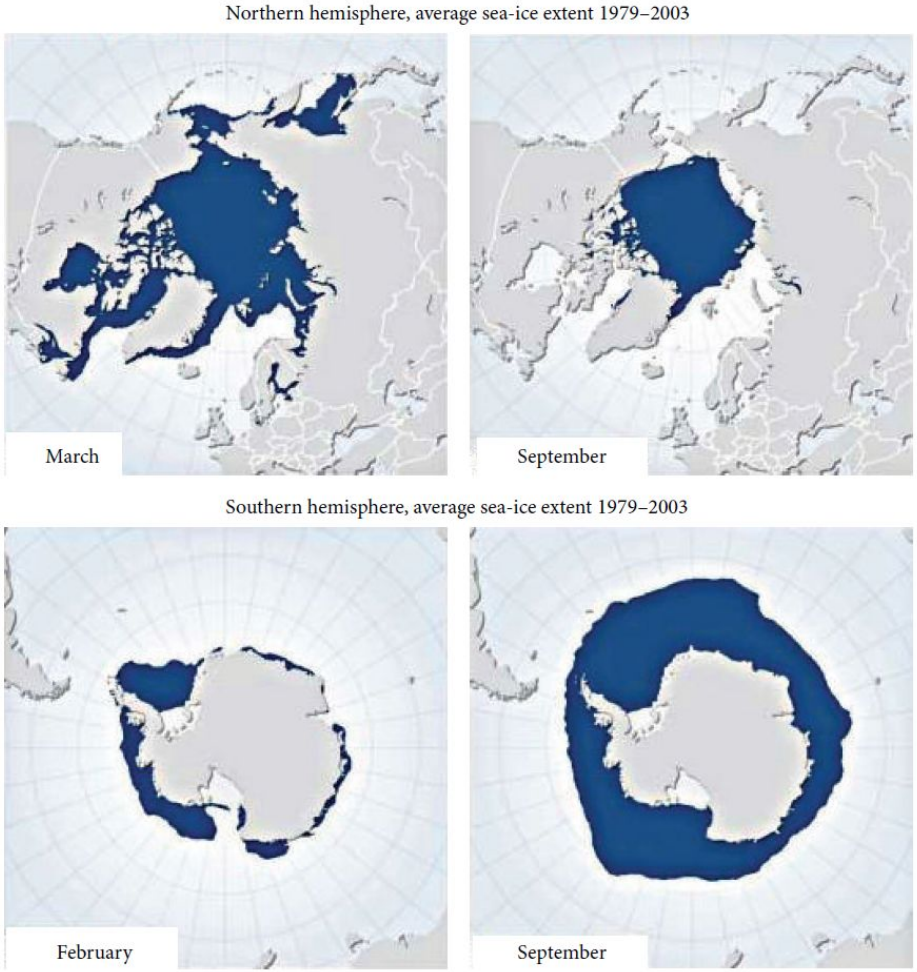
3) Cosmic Rays act as condensation nuclei for low clouds

4) Fewer condensation nuclei mean fewer cooling clouds, meaning warmer temperatures

The Earth has a Global Electric Circuit and weather that connects with space. The spacequakes and especially the fast plasma jet that causes them and the auroras is part of the Electric Universe circuit in our solar system.



Confronto tra la temperatura e l'estensione del ghiaccio marino dell'Artico e dell'Antartico: valori osservati e modellati



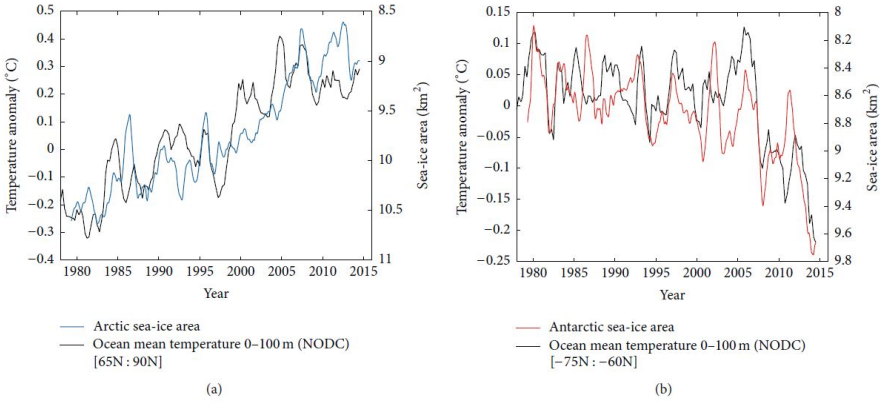


FIGURE 8: (a) The Arctic and (b) Antarctica. NODC ocean mean temperature (depth 0–100 m) temperature anomaly (black) versus the sea-ice area (color).

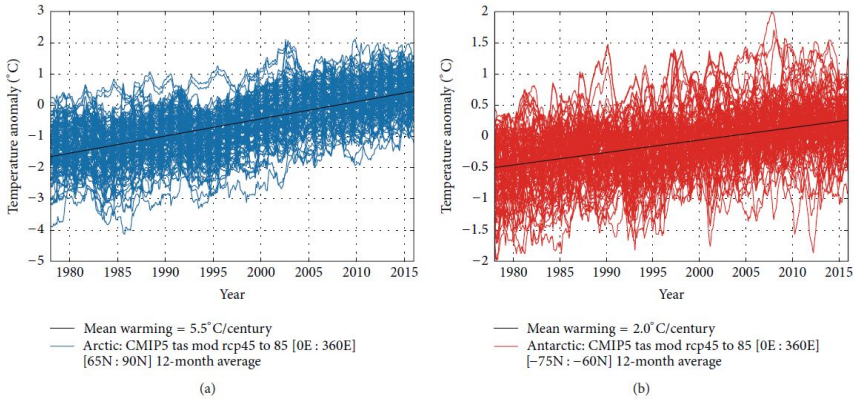


FIGURE 9: (a) The Arctic and (b) Antarctica. 106 CMIP5 simulations of the surface temperature anomaly (color) and of their mean trend (black).

Scafetta, N. & Mazzarella, A.: Advances in Meteorology,Volume 2015, Article ID 481834

Confronto tra la temperatura e la copertura nuvolosa

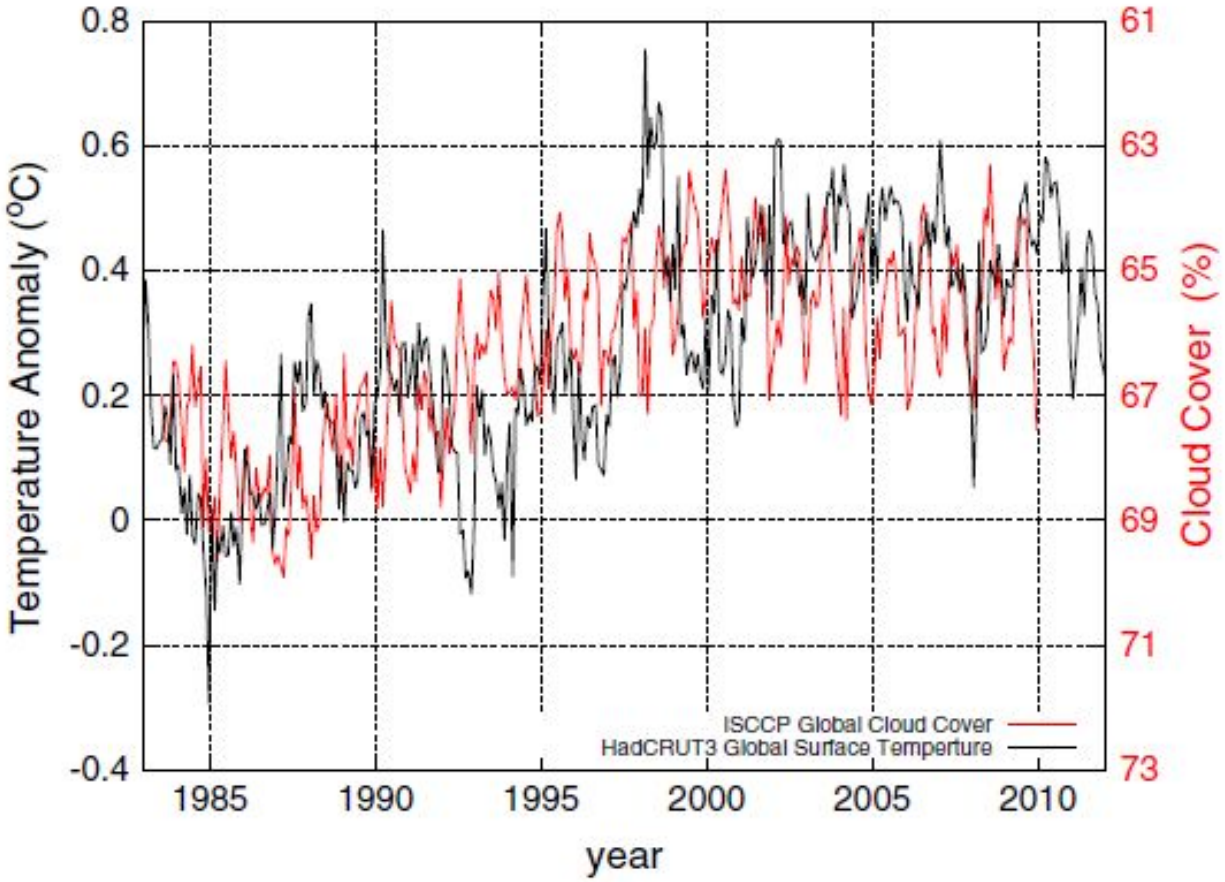
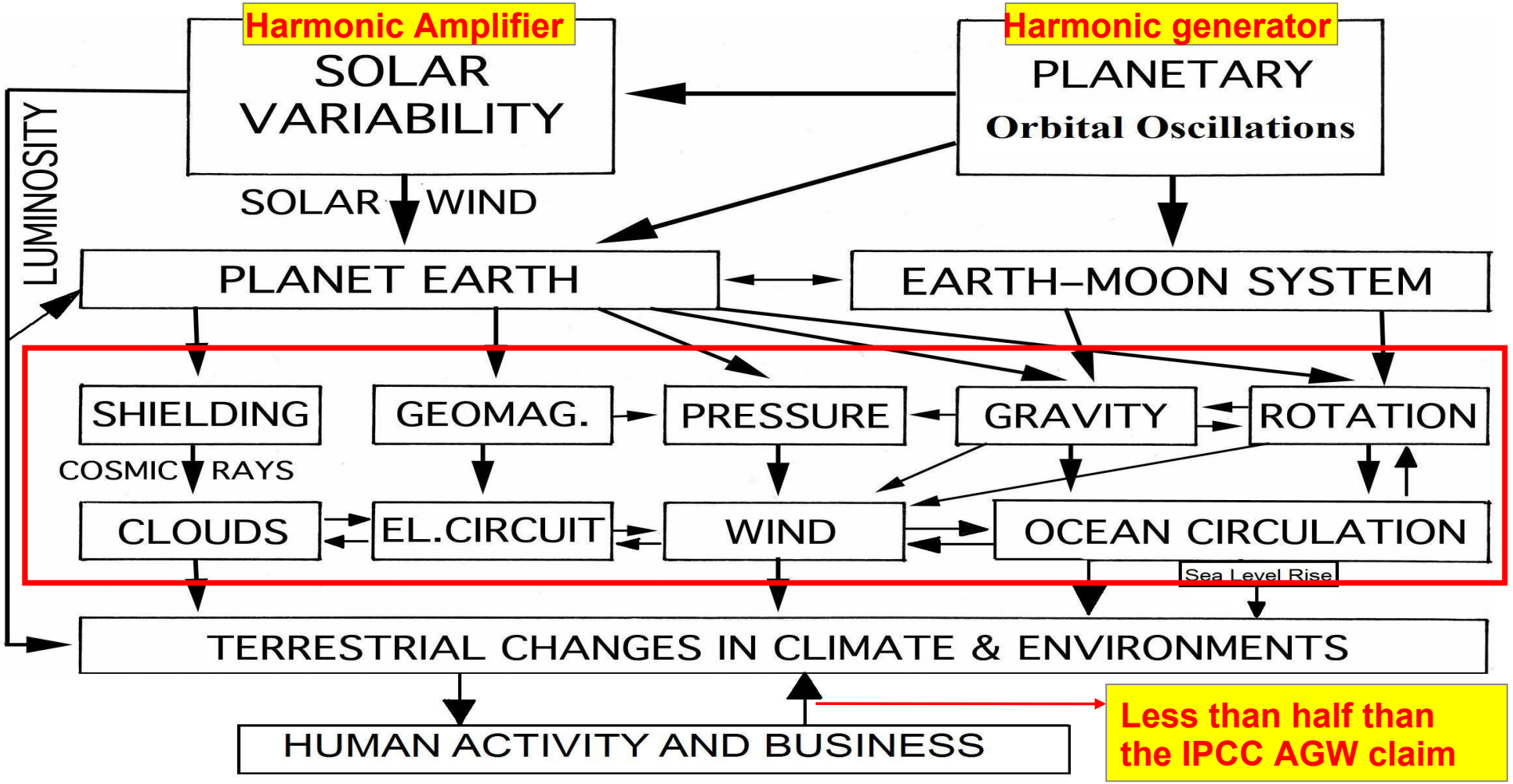


Fig. 19. Global surface temperature (black) against monthly variations in total global cloud cover since July 1983 (red). Correlation coefficient: $r_o = -0.52$, for 318 points $P(|r| \geq |r_o|) < 0.0005$. The cloud data are from the International Satellite Cloud Climatology Project (ISCCP). Cloud data from http://isccp.giss.nasa.gov/pub/data/D2BASICS/B8glbp.dat

Scafetta, N.: Earth-Science Reviews 126 (2013) 321–357

Conclusioni

After N.-A. Morner



- Solar and climate dynamics are coupled and synchronized with astronomical harmonics
- The Sun likely works as a strong amplifier of the gravitational oscillations of the solar system
- Solar/Lunar tidal (multi-)decadal harmonics are present in the climate system
- Current climate general circulation models (CMIP3 and CMIP5 GCMs) are seriously flawed.
- Natural cyclical variability has contributed at least 50% of the 20th century warming
- Climate sensitivity varies from about 1 °C and 2 °C with median about 1.5 °C