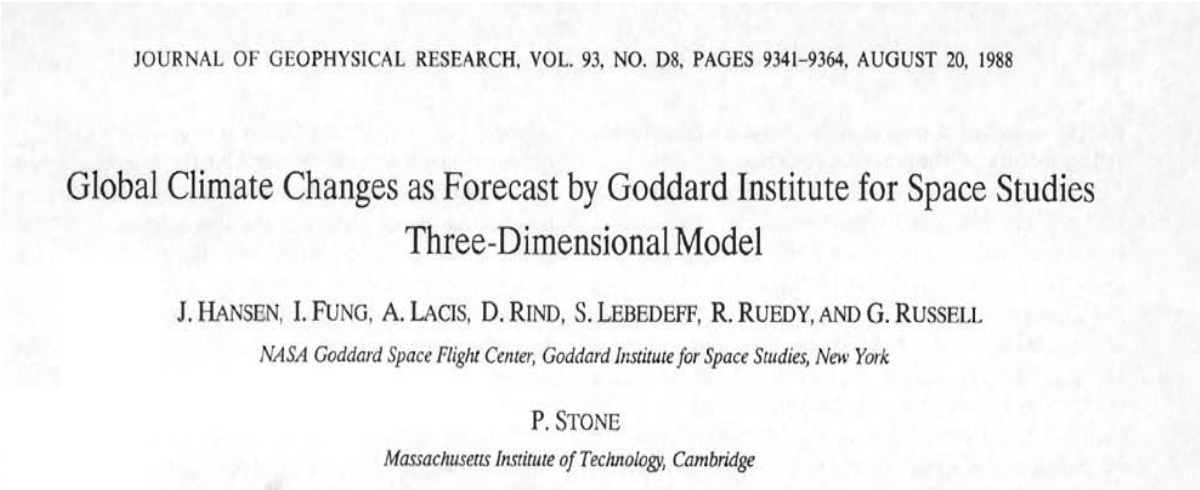
# *HANSEN MARS CHALLENGE*

A challenge to Hansen et al 1988:



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Global Climate Changes as Forecast by Goddard Institute for Space Studies Three-Dimensional Model

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No matter what scientific facts are presented to challenge the AGW ideology it is impossible for scientists to sway public opinion on this issue because the issue is political. It is very easy for high profile people who quote a scientific consensus that is supported by sophisticated computer models to convince the general public of anything that they want.

Even though the computer models have never yielded a single result that matches observations, any criticism of the models is met with some sort of complex justification that is beyond the comprehension of the general public so it is readily accepted by the masses and those questioning the validity of the models are vilified by the promoters of the AGW agenda as skeptics and deniers who are in the pockets of big oil.

The sole support for AGW is the climate models, and the sole support for the climate models with respect to $CO_2$ is the forcing parameter. There is no actual physical rational for the forcing parameter, because it was simply contrived from the assumption that observed warming of 0.6°C was due entirely to a 100ppmv increase in atmospheric $CO_2$ concentration. There was never any verification of this parameter either by theory or observation. There is no justification for this parameter based on the physical properties of $CO_2$, because the molecular configuration of the $CO_2$ molecule precludes any significant effect from $CO_2$ beyond a concentration of 300ppmv, and the current concentration is 386ppmv.

There is no justification for this parameter based on observation because the observed notch in the spectrum created by $CO_2$ is virtually identical for both the Earth and Mars, and Mars has over 9 times the physical concentration of $CO_2$ in its atmosphere than the Earth has in its atmosphere.

Even the reference temperature value for the parameter is faulty because the maximum temperature increase possibly attributable to human $CO_2$ emissions is 0.1°C per century; not the 0.6°C that is used in the forcing parameter.

The climate models use a forcing parameter based on the equation:

**$CO_2$ rf = f * ln([$CO_2$]/[$CO_2$]prein)/ln(2)**
**where f= rf for $CO_2$ doubling**

In further documentation according to the IPCC, the "Radiative Forcing" ÄF, in watts per square meter, due to additional carbon dioxide in the atmosphere, can be calculated from the formula:

**ÄF = 5.35 ln C/Co**

The value **5.35** in this equation and the term **[$CO_2$]prein** in the generalized equation demonstrate that the forcing parameter is based on the 100ppmv increase from the preindustrial value of 280ppmv and the 0.6°C of measured temperature over the time period that this 100ppmv increase occurred.

Further documentation in the IPCC reports states that the forcing of **each watt/$m^2$ raises the global temperature by 0.75°C $\pm$ 0.25°C**.

The Nimbus 4 satellite measured the thermal radiation spectrum of the Earth in 1970, when the $CO_2$ concentration was 325ppmv as measured at Mauna Loa.

Mars has an atmosphere that is 95% $CO_2$ with virtually zero water vapour and the remaining 5% of the atmosphere is comprised of $O_2$ $N_2$ and Ar, so $CO_2$ is essentially the only "greenhouse gas".
The atmosphere on Mars is so thin that the 950,000ppmv concentration of $CO_2$ only represents about 9 times more actual $CO_2$ than is in the Earth's atmosphere in absolute terms.

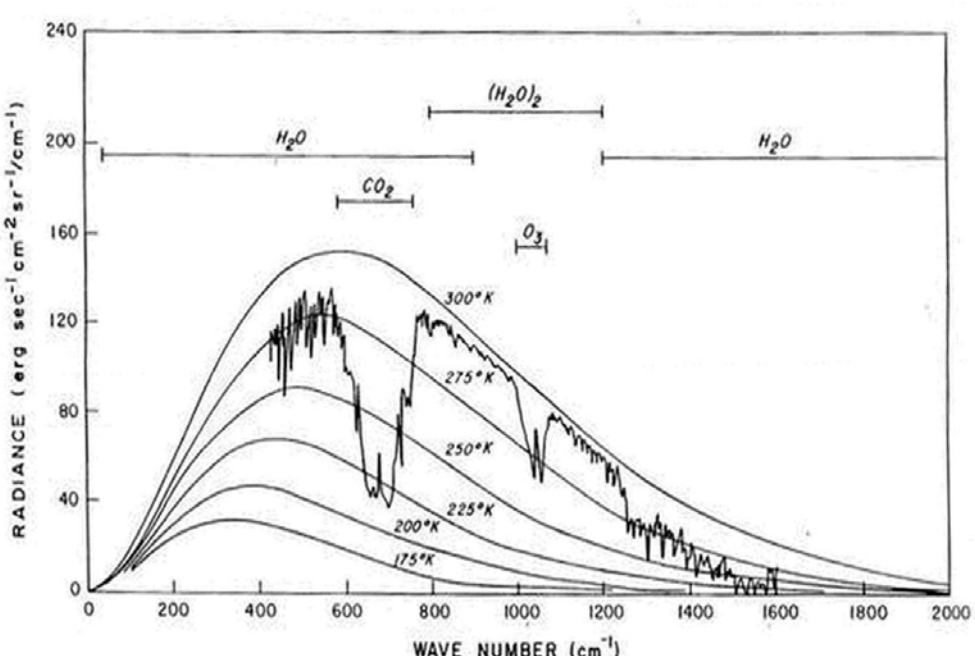
Recent measurements of the thermal radiation spectrum from Mars should show a spectral notch from $CO_2$ that representing an increase in forcing representing the 9 times difference in $CO_2$ according to the equation:

**ÄF = 5.35 ln C/Co**

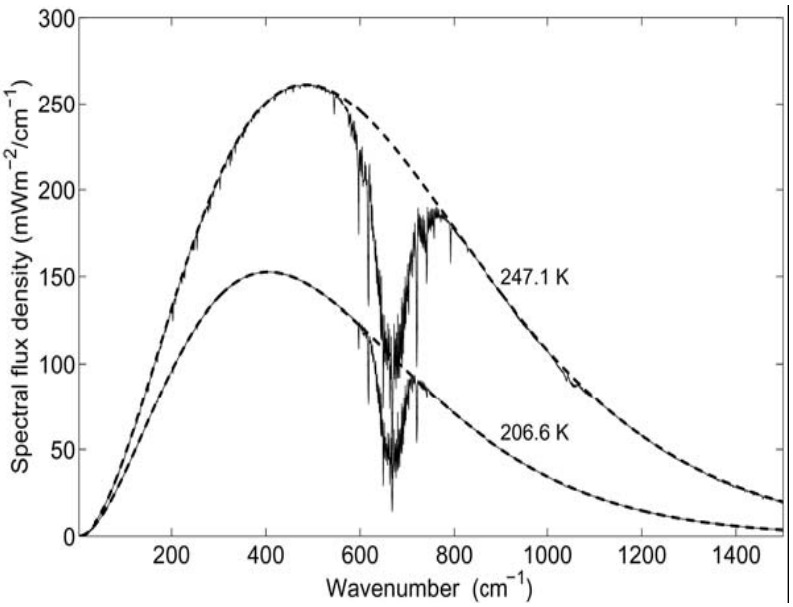
Considering that this formula gives a forcing value of 3.708watts/$m^2$ for just a doubling of $CO_2$, this value of 11.755watts/$m^2$ for a 9-fold difference should be readily visible on the two measured spectra.

The spectral notch is virtually identical on both the 1970 Earth spectra with a 325ppmv and the Mars spectra from at least 9 times the concentration indicating that there is virtually no effect increases in $CO_2$ beyond 325ppmv.

EARTH THERMAL RADIATIVE SPECTRUM




MARS THERMAL RADIATIVE SPECTRUM




This clearly falsifies the equation and the numerical values used to determine the forcing parameter of the climate models that support the AGW hypothesis.

In addition to this physical evidence of an invalid assumption forming the basis for the forcing parameter, there is a blatantly obvious error in the actual values used in determining the magnitude of the forcing parameter. The temperature record shows that the global temperature has been increasing naturally at a rate of about 0.5°C/century since the Little Ice Age. The forcing parameter is based on the full measured 0.6°C/century without subtracting the natural warming of 0.5°C/century giving a forcing parameter that is 6 times larger than can be attributed to the measured increase in $CO_2$.

Far less obvious, but the major fatal flaw of the forcing parameter is that it is based on an observation of temperature and $CO_2$ concentration without taking into account the actual physical properties of $CO_2$ and its limited effect on thermal radiation as defined by quantum physics.

As you are aware, certain gases can be caused to rotate and vibrate by thermal radiation. The rotation mode is relatively independent of wavelength but the vibration mode is limited to specific resonant wavelength bands. The rotation mode results from the interaction between the thermal energy and the dipole moment of the gas molecule. The carbon dioxide molecule is formed from two oxygen atoms equidistant from a central carbon atom and all three atoms are in a perfectly straight line. This configuration and

symmetry eliminates any dipole moment, limiting the $CO_2$ molecule to vibration modes only.

There is only a single vibration mode of $CO_2$ that resonates within the thermal spectrum radiated by the Earth (and Mars). This bend vibration resonates with a band of energy centred on a wavelength of 14.77microns (wavenumber 677$cm^{-1}$) and the width of this band is quite narrow as depicted on the spectra from Earth and Mars.

It only takes a minute amount of $CO_2$ to fully "capture" the energy at the resonant wavelength, and additional $CO_2$ progressively captures energy that is further and further from the peak wavelength. At the 280ppmv $CO_2$ preindustrial level used as reference in the forcing parameter, about 95% of the energy bandwidth that could possibly be captured by $CO_2$ has already been captured. There is only 5% of this limited energy available within the confines of this potential "capture" band left to be captured.

The greenhouse effect from $CO_2$ is generally stated as 3°C, so an additional 100ppmv above the 280ppmv level is only capable of generating a maximum 5% increase or 0.15°C. The forcing parameter is based on a full 0.6°C which is four times the 0.15°C absolute physical limit of warming from $CO_2$.

Furthermore if this 0.15°C increase has used up the full 5% of the remaining possible energy as the concentration reached 380ppmv, there is zero warming possible from further increases in $CO_2$.

This is why the $CO_2$ notch is virtually identical in the two spectra; the $CO_2$ band was virtually saturated at the 325ppmv concentration level, so even nine times more $CO_2$ has almost no appreciable effect.

Unless all these points can adequately be addressed, the climate models based on this forcing parameter must be declared invalid, and all work based on these models as a reference for global warming mitigation must also be declared invalid.

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