New Confirmation of Strong Solar Forcing of Climate

by

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The IPCC stated in Climate Change 1995 that "forcing due to changes in the Sun's output over the past century has been considerably smaller than anthropogenic forcing." Estimates shown in a figure allotted about 10% to solar forcing and 90% to forcing due to human greenhouse gas contributions. IPCC's draft of the Third Assessment Report (TAR 2000) continues attributing to the Sun a minor role in climate change.

According to the expert review "the temporal evolution indicates that the net natural forcing (solar and volcanic aerosol) has been negative over the past two and possibly even the past four decades." The estimate of solar forcing remains the same as in Climate Change 1995: It is "considerably smaller than the anthropogenic radiative forcings", and its "level of scientific understanding" is "very low", whereas forcing by well-mixed greenhouse gases "continues to enjoy the highest confidence level" as to its scientific understanding. Everything taken together, TAR 2000 considers it "unlikely that natural forcing can explain the warming in the latter half of this century."

Conforming assertions are to be found in the peer reviewed literature **(e.g. Tett et al., Nature 399 (1999), 569-572; Fröhlich and Lean, Geophys. Res. Lett. 25 (1998), 4377-4380).**

Successful prediction is the ultimate test whether science is in accordance with reality. If it were correct that the Sun's forcing of climate was negligible in the second half of the 20th century and will be so in the future, it should have been impossible in recent decades to predict climatic phenomena exclusively on the basis of cycles of solar activity. Repeated forecast experiments show, however, that the contrary is true. I have shown in my paper **"Solar Activity: A Dominant Factor in Climate Dynamics"**, that a torque cycle in the Sun's motion about the center of mass of the solar system can be taken to predict energetic solar eruptions and related climate phenomena. Figure 24 of this paper shows that all maxima and minima in global temperature anomalies observed by balloon sondes after 1958 are explained by the solar torque cycle. This is no mere theoretical relationship. My paper **"Sun's Role in the Satellite-Balloon-Surface Issue"** describes how it was possible to forecast the cold winter 1996/1997 and the hot spring and summer 1998 on this basis. The torque cycle also played an important part in my long-range forecasts of the last two El Niños which turned out correct (See my paper **"Solar Activity Controls El Niño and La Niña"**). It should be noted that all these skillful forecasts fall at the recent decade that should show no traceable solar effect. This is also true of a highly significant correlation between the torque cycle and NOAA's Big Climate Events after 1950, presented in my paper **"Top Climate Events Linked to Solar Motion Cycle."**

A further forecast, submitted in March 2000 to the Hydrological Sciences Journal and published in June 2000, corroborates the strength of solar forcing. A copy of the publication is given below so that sceptics can check the wording that relates the successful forecast to the torque cycle in the Sun's motion. On this basis, it was predicted that around 2001.1 a wet period should develop in the river Po catchment area in Northern Italy. This has turned out to be correct. After a protracted dry period, the predicted wet period has been initiated by severe floods in Northern Italy that began in mid-October and continued in November 2000. Observational experience shows that wet periods, once initiated, continue for months. This indicates that even now, at the beginning of the new century, the well-tried solar motion cycle continues to provide evidence that there is dominant solar forcing of climate.

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Discussion

Natural climatic changes and solar cycles: an analysis of hydrological time series By Mario Tomasino & Francesco Dalla Valle, Hydrological Sciences Journal 45(3)

There is a tradition that the Editor invites discussion of every paper published in Hydrological Sciences Journal. In principle, the discussion period starts from the moment of publication of the paper in question and ends six months afterwards. Some time later, the discussion (or discussions) and authors' reply are published in one issue of the journal. In this issue, the original paper, the discussion and the reply are published next to each other. How did it happen? The authors of the original paper, accepted for publication in Hydrological Sciences Journal, sent their contribution to Dr Theodor Landscheidt, an expert in cycles of solar activity. Dr Landscheidt decided to make an interdisciplinary contribution in the form of a discussion. Under such circumstances, and for the benefit and convenience of our readership, the Editor has decided that all three items should be published in the same, present issue.

The discussion foresees changes of solar parameters which may influence the process of river flow. It will be interesting to see how these forecasts fare in comparison to the data which will be observed in the near future. Do we witness the advent of an operational tool for medium- and long-term flow forecasting?

River Po Discharges and Cycles of Solar Activity

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Chaos theory teaches us that boundaries between different fields are rife with creative potential. The interdisciplinary paper **"Natural climatic changes and solar cycles: An analysis of hydrological time series"** by M. Tomasino and F. Dalla Valle is a case in point. It presents evidence that climate patterns in quite different world regions show common traits that point to forcing external to the earth's climate system. The authors' frequency analysis shows that the most plausible external forcing agent, the Sun's varying activity, is involved in the common features.

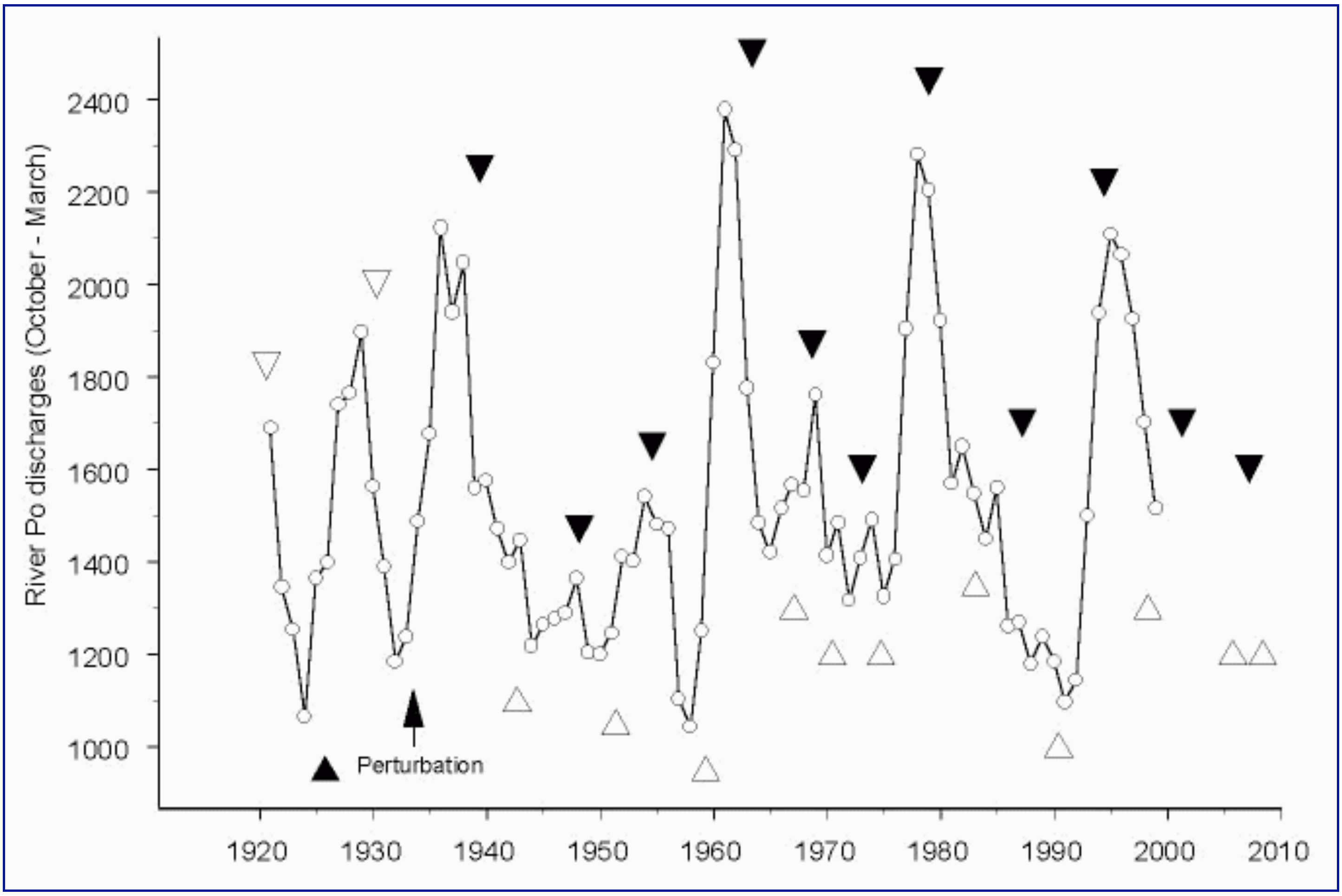
The spectrum of variations in the level of Lake Victoria yields a peak at 11 years, the well known period of the sunspot cycle. Yet the strongest peak in the analysis of River Po discharges appears at 8.7 years, a wave length that most astrophysicists and climatologists do not associate with solar activity. So an explanation is in order, especially as the time series of River Po discharges is used by the authors to forecast periods of droughts and floods as well as instances of slime bloom in the Adriatic Sea.

The 11-year cycle is not the only cycle of solar activity. In addition to the secular sunspot cycle of 80 - 90 years which modulates the intensity of the 11-year cycle, valid cycles have been derived from the Sun's irregular oscillations about the centre of mass of the solar system. It has been shown that these solar motion cycles (SMC) are so closely connected with climate phenomena that dependable forecasts of droughts and floods, strong negative and positive anomalies in global temperature, and even El Niños and La Niñas can be based on this relationship **(Landscheidt 1987, 1988, 1995, 1998, 1999)**.

The figure below plots smoothed River Po discharges as presented in Figure 5 of the paper by Tomasino and Dalla Valle. Filled triangles mark maxima and empty triangles minima of a fundamental SMC formed by the absolute rate of change |dL/dt| in the Sun's orbital angular momentum. After 1933, all maxima of |dL/dt| coincide relatively closely with outstanding discharge maxima, whereas all of the |dL/dt| minima mark discharge minima. The high discharge maximum in 1961 occurred 2 years before the |dL/dt| maximum, but around 1958 the strongest ever observed activity in the 11-year sunspot cycle occurred which could have shifted the discharge maximum away from the |dL/dt| maximum.

Before 1933, the relationship was reversed by a pi radians phase shift. It occurred when dL/dt was exposed to a perturbation that deformed the sinusoidal course of the change in the Sun's orbital angular momentum.Such disturbances were also observed in other solar-terrestrial time series. The date of the perturbation is indicated by an arrow. The next |dL/dt| maximum will occur in 2001.1. Around this epoch a wet period is to be expected in the River Po catchment area. The next |dL/dt| minima fall at 2005.8 and 2008.4 and are interrupted by a maximum in 2007.1. The corresponding change in the River Po discharges should be comparable to the small variations in the period 1970 - 1975 which showed a similar pattern of |dL/dt| extrema at short intervals.

The relationship presented in this discussion contribution is corroborated by the frequency spectrum of River Po discharges in Figure 8b of the discussed paper. The mean interval between minima in |dL/dt| is 8.6 years. This is very close to the strongest spectral peak at 8.7 years.



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