Geophysical Research Abstracts,
Vol. 11, EGU2009-6141, 2009
EGU General Assembly 2009


# The non-linear relationship between length of the day, geomagnetic field and solar dynamo magnetic field.

S. Duhau (1) and C. de Jager (2)

(1) Buenos Aires University, Facultad de Ciencias Exacats y Naturales, Florida, Buenos Aires, Argentina (silvia.duhau@gmail.com), (2) Royal Netherlands Institute for Sea Research; P.O. Box 59, 1790 AB Den Burg, The Netherlands. cdej@kpnplanet.nl

It has been suggested that length of the Day in the decadal time scale is related to solar activity. Here, the non-linear relationship between time changes in the involved variables is analyzed by a Morlet wavelet base function by the methodology introduced in a previous paper (ST1. XX, EGU 2009). It is found that for the purpose of the present study, it is convenient to split the amplitude modulation of the two components of the magnetic 11-year cycle in four oscillations, VIZ.: Hale, semi-secular, Gleissberg and millennial. The same procedure is then applied to split the length of the day, the westward drift and the time derivative of the geomagnetic dipolar field time series. The amplitudes and phases of each of the four oscillations in the five time series are then compared. The most relevant result is that the millennial and the semi-secular oscillations in the solar dynamo magnetic field components are also visible in the variations of the length of the day, where they appear 70 and 94 years later, even concurrent with the largest time delay in the derivative of the dipolar component and with the westward drift of the geomagnetic field variations. From these results and in the light of present solar and Earth's dynamo theories the origin of the variation in solar and Earth dynamo magnetic fields in the millennial and the semi-secular time scales is discussed.