



On the correlation between solar activity and terrestrial climate

P. Ballatore

Mediterranean Agency for Remote Sensing and Environmental Control, Via Perlingieri,
Benevento, 82100, Italy (paolab@marsdb.it)

While there is a high degree of certainty about the existence of an important contribution from solar activity on the terrestrial climate [1], the modelling of the causality between solar and terrestrial environmental parameters is more aleatory, although some kind of correlations can be established, at times, between solar and climatic variability [2]. On the other hand, significant correlations between the geomagnetic activity and terrestrial weather parameters are recurrent in recent literature [3, 4], such as the certain existence of some relationship between solar and geomagnetic indicators [5]. This suggests that the influence of the solar activity on lower atmospheric layers is mediated by several concurring physical processes. For example, one crucial factor for solar energy and particle transfer into the terrestrial system is the coupling between the interplanetary magnetic field and the magnetosphere [6]. In the present work, the relationship between the solar and the lower atmospheric parameters is modelled through a multivariate statistics, by taking into account both solar and geomagnetic activity for the estimation of terrestrial climate indicators.

References.

- [1] B.A. Tinsley, Space Sci. Rev., 00, 1-18, 2000. [2] P. Laut, Journ. of Atmosph. and Solar-Terrestr. Phy., 65, 801-812, 2003. [3] P. Ballatore, COSPAR Meeting 04-A-03394, Paris, 2004. [4] V. Bucha, and V. Jr Bucha, J. Atmos. Solar Terr. Phys., 60, 145, 1998. [5] R. Stamper, et al., Journ. Geophys. Res., 104, 28325-28342, 1999. [6] P. Ballatore, and W. Gonzalez, Earth Planets and Space, 55, 427-435, 2003.