

Solar Variability and Earth's climate

Monte Porzio Catone, June 27 - July 1, 2005

editors: Ilaria Ermolli, Judit Pap and Peter Fox

TABLE OF CONTENTS

<i>Foreword</i>	711
<i>List of Participants</i>	713
Session I: Solar Radiation and Climate Records - Status and Current Measurements	
M. P. Rast <i>Solar variability: a brief review</i>	719
C. Fröhlich <i>Solar irradiance variability since 1978: revision of the PMOD composite during Solar Cycle 21</i>	731
J. Harder, J. Fontenla, O. White, G. Rottman and T. Woods <i>Solar spectral irradiance variability comparisons of the SORCE SIM instrument with monitors of solar activity and spectral synthesis</i>	735
A. G. Kosovichev <i>Sun's Global Property Measurements: helioseismic probing of solar variability</i>	743
J. Beer <i>Solar variability and climate change</i>	751
A. Mangini <i>Assessing the variability of precipitation during the Holocene from stalagmite records</i>	755
O. Raspopov, V. Dergachev, O. Kozyreva, and T. , Kolström <i>Climate response on de Vries solar cycles: evidence from Juniperus turkestanica tree-rings in Central Asia</i>	760

Session II: Mechanisms and Physical models for Irradiance Variations

- C. J. Schrijver
Solar and stellar variability 766
- S. Sofia and L. H. Li
Mechanisms for global solar variability 768
- D. Schmitt
Origin of solar magnetic variability 773
- S. K. Solanki and M. Schussler
Mechanisms of secular magnetic field variations 781
- O. Steiner and A. Ferriz-Mas
The deep roots of radiance variability 789

Session III: Mechanisms and Physical models for Climate Variations

- E. Zorita and H. von Storch
Methodical aspects of reconstructing non-local historical temperatures 794
- C. Amman
Solar signal in records and simulations of past climate 802
- C. Field, G. A. Schmidt and D. Koch
Solar and climatic effects on ^{10}Be 805
- U. Cubasch, G. Bürger, I. Fast, Th. Spanghel and S. Wagner
The direct solar influence on climate: modeling the lower atmosphere 810

Session IV: Modelling of Solar Irradiance Variations

- S. R. Walton
Modeling total solar irradiance: the data, the models, the questions 819
- J. Fontenla and G. Harder
Physical modeling of spectral irradiance 826
- N. Krivova and S. K. Solanki
Modelling of irradiance variations through atmosphere models 834
- A. Vögler
On the effect of photospheric magnetic fields on solar surface brightness: results of radiative MHD simulations 842
- J. Morrill
Calculating solar UV spectral irradiance using observed spectral radiance and full disk Ca II K images 850
- V. Penza, E. Pietropaolo and W. Livingston
Study of photospheric line depth variations along the solar cycle 856

S. Lefebvre, R. K. Ulrich, L. S. Webster, F. Varadi, J. Javaraiah, L. Bertello, L. Werden,
J. E. Boyden and P. Gilman

*The solar photograph archive of the Mount Wilson Observatory: A resource for a
century of digital data* 862

Session V: Mechanisms and Physical Models for Climate Variations: Coupling of the Middle and Lower atmosphere

U. Langematz, K. Matthes and J. L. Grenfell

*Solar impact on climate” modeling the coupling between the middle and the lower
atmosphere* 868

E. Rozanov, M. Schraner, T. Egorova, A. Ohmura, M. Wild, W. Schmutz and T. Peter
*Solar signal in atmospheric ozone, temperature and dynamics simulated with CCM
SOCOL in transient mode* 876

K. Coughlin, Ka-Kit Tung and D. Camp

Tropical versus extratropical changes related to solar flux variations 880

Session VI: Sun-Earth Connections

A. Meloni, P. De Michelis and R. Tozzi

*Geomagnetic storms, dependence on solar and interplanetary phenomena: a re-
view* 882

U. Villante, M. De Laetis, P. Francia, M. Vellante and A. Piancatelli

*Solar wind-magnetosphere interaction as observed in the geomagnetic field varia-
tions in the polar regions* 888

O. Troshichev, L. Egorova, A. Janzhura and V. Vovk

*Influence of the disturbed solar wind on atmospheric processes in Antarctica and
El-Nino Southern Oscillation (ENSO)* 890

M. Vellante and M. Förster

Dependence of geomagnetic field line resonant frequencies on solar irradiance 899

Session VII: Perspective and Future Developments of Sun-Climate Research

G. Thuillier

Status of solar global properties measurements: PICARD mission 901

P. N. Bernasconi, P. Foukal, D. M. Rust and B. J. LaBonte

Finding the sources of solar irradiance at sunspot minimum 907

Closing remarks

P., Brekke

Closing remarks on the Sun influence on climate change 913

Poster Session

- L. Alfonsi, G. de Franceschi, M. Lester, C. N. Mitchell, V. Romano, P. Spalla and P. Yin
A network for upper atmosphere monitoring at high latitudes of the northern hemisphere 919
- Y.M. Almleaky, M.A. Sharaf, H.M. Basurah, A.A. Malawi and Z.A. Al-Mostafa
Temperature increasing trend due to solar activity at Western Saudi 923
- Z. A. Al-Mostafa
Calculation of sky turbidity in the Kingdom of Saudi Arabia 925
- L. Balmaceda, S. K. Solanki and N. Krivova
A cross-calibrated sunspot areas time series since 1874 929
- I. Baumann and M. Schüssler
A necessary extension of the surface flux transport model 933
- Y. Calisesi, K. Hocke and N. Kämpfer
The natural variability of stratospheric and mesospheric ozone as observed over Switzerland by a ground-based microwave remote sensor 937
- M. Centrone, I. Ermolli and F. Giorgi
Image processing for the Arcetri Solar Archive 941
- S. Criscuoli and M. P. Rast
A study of the photometrical properties of solar magnetic features by numerical simulation 945
- S. Danilovic and I. Vince
Variability of the Mn I 539.4 nm solar spectral line parameters with solar activity 949
- G. Del Zanna, V. Andretta and A. Beaussier
The EUV spectral irradiance from 1996 to 2003 as obtained from SOHO 953
- P. De Michelis, R. Tozzi and A. Meloni
Geomagnetic jerks" observation and theoretical modeling 957
- Z. Fazel, J. P. Rozelot, S. Pireaux, A. Ajabshirizadeh and S. Lefebvre
Solar irradiance, luminosity and photospheric effective temperature 961
- K. Georgieva, B. Kirov and C. Bianchi
Long-term variations in the correlation between solar activity and climate 965
- K. Georgieva, C. Bianchi and B. Kirov
Once again about global warming and solar activity 969
- S. Giordano, F. Berrilli and D. Del Moro
High resolution observations of chromospheric network 973
- F. Giorgi, I. Ermolli, M. Centrone and E. Marchei
Calibration of the Arcetri Solar Archive Images 977

- L. Győri, T. Baranyi, J. Muraközy and A. Ludmány
Recent advances in the Debrecen sunspot catalogues 981
- L. Győri, T. Baranyi, J. Muraközy and A. Ludmány
Comparison of sunspot area data determined from ground-based and space-borne observation 985
- A. Kilcik, O. Golbasi, H. Kilic, V. Ozkan and A.Y. Yuceer
Usability of solar radius variations as an indicator of solar activity and influence on climate 989
- S. Lefebvre, J. P. Rozelot, S. Pireaux, A. Ajabshirizadeh and Z. Fazel
Global properties of Sun and stars” what can we learn from irradiance and shape? 994
- S. Lepidi, L. Santarelli, L. Cafarella and P. Palangio
The Earth’s passage of coronal mass ejecta on october 29-31, 2003: ULF geomagnetic field fluctuations at very high latitude 998
- P. Mauas and E. Flamenco
Solar activity and the streamflow of the Paraná River 1002
- G. Mezo and T. Baranyi
HTML presentation of the Debrecen Photoheliographic Data sunspot catalogue 1004
- G. Muscari, M. Pezzopane, V. Romaniello, R.L. de Zafra, C. Bianchi and G. Fiocco
On the potential impact of large electron concentrations on mesospheric ozone 1007
- S. Naitamor
Coronal Mass Ejection: theirs sources and geomagnetic disturbances 1011
- A. Nigro, A. Pagano and F. Zuccarello
Global warming: solar variability and energy consumption 1015
- A. Ortiz and M. Rast
How good is the Ca II K as a proxy for the magnetic flux? 1018
- C. Perna
SAMOA Solar and Atmospheric Measurements and Observations Archive 1022
- D. I. Ponyavin, T. V. Barliaeva and N. V. Zolotova
Hypersensitivity of climate response to solar activity output during the last 60 years 1026
- M. S. Quassim and A. F. Attia
Forecasting the global temperature trend according to the predicted solar activity during the next decades 1030
- J. L. R.Saba, K. T. Strong, and G. L. Slater
Can we predict when the next solar cycle is about to take off? 1034
- J. Skupin, M. Weber, S. Noël, H. Bovensmann, and J.P. Burrows
GOME and SCIAMACHY solar measurements: solar spectral irradiance andMg II solar activity proxy indicator 1038

P. Stoeva and A. Stoev	
<i>Cave air temperature response to climate and solar and geomagnetic activity</i>	1042
C. Taricco and S. Alessio	
<i>Decadal and centennial cycles revealed in two climate isotopic</i>	1048
E. S. Vernova, M. I. Tyasto and D. G. Baranov	
<i>Solar magnetic cycle and longitudinal distribution of solar activity</i>	1052
I.S. Veselovsky	
<i>Similarity and diversity of solar extreme events</i>	1056
U. Villante, A. Nubile, P. Di Giuseppe, P. Francia and M. Vellante	
<i>ULF oscillations at discrete frequencies: a comparison between ground, magneto-spheric and interplanetary measurements</i>	1060
N. Vitas and I. Vince	
<i>NLTE Effects in formation of variable Mn I 539.4 nm line in solar spectrum</i>	1064
B. Viticchié, D. Del Moro, F. Berrilli and A. Egidi	
<i>Magnetic reconnection driven by a synthetic photospheric velocity field</i>	1068
V.V. Zharkova, S.I. Zharkov and A.K. Benkhalil	
<i>North-South asymmetry in the solar cycle 23 extracted from the Solar Feature Catalogues</i>	1072
G. Zherebtsov, V. Kovalenko and S. Molodykh	
<i>The effect of solar activity on the Earth's climate changes</i>	1076