

CURRICULUM VITAE ET STUDIORUM

Elisa Carboni

Atmospheric, Oceanic & Planetary Physics
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EDUCATION

- 2001-2004* Ph.D in "Physical modeling for environmental protection", at the University of Bologna. (Giudizio Ottimo)
Thesis title: "Aerosol remote sensing from high resolution nadir satellite spectrometers". Realised in cooperation with ISAC - C.N.R. in the frame of the research activities of Atmospheric Remote Sensing group, Supervisor: R.Guzzi.
- 1998* Degree in Physics, grade 109/110, at the University of Bologna.
Thesis title: "Multi-spectral sun-photometer measurements aimed at the determination of the optical properties of aerosol particles of continental and maritime origin";
Master thesis (2 years) realised at Fisbat (now ISAC) Institute - C.N.R. Supervisor: C. Tomasi. In the frame of research activities conducted by the Radiation and Climate Effect group.
- 1991* "Maturità scientifica", awarded after 5 years of Liceo Scientifico "Augusto Righi" in Bologna.

RESEARCH TOPICS

- Aerosol retrieval from satellite spectral radiance measurements (ATSR/2, AATSR, MSG SEVIRI, GOME and SCIAMACHY data) in the UV, VIS and IR spectral range.
- Optical properties of atmospheric aerosols. Characterisation of different desert dust, biomass burning and volcanic ash aerosol type.
- Multi-spectral sun-photometer measurements (calibration, determination of aerosol optical depth, Angstrom coefficients and estimating errors due to the influence of diffuse radiation).
- Radiative transfer modeling and investigation of the aerosol direct effect via energy flux calculations.
- UV radiation, molecular scattering.

COMPUTER SKILLS

- Program languages: Fortran 77/90, IDL, Matlab, shell script, some experience of C.
- Operating systems used: Unix (linux, solaris), Windows (95, NT, 2000, XP).
- Experience writing web pages with HTML

CURRENT RESEARCH PROJECTS

ICICLE (NERC): Infrared Cirrus CLoud Experiment. Retrieval of cloud properties from infrared limb emission measurements using HIRDLS (EOS-AURA Mission Spacecraft) and MIPAS (Envisat) data.

Sahara dust project (NERC): Radiative impact of desert dust over Western Africa and the eastern subtropical Atlantic Ocean using the geostationary GERB and SEVIRI instruments on Meteosat 8 and AATSR on Envisat.

GlobAerosol (E.S.A. Data User Element Program): Global Aerosol from Earth Observation. It aims to provide daily global aerosol maps for 1995-2005 from European satellite instruments: ATSR-2, AATSR, MERIS and MSG SEVIRI.

GRAPE (CWVC – NERC Program): Global retrieval of ATSR Cloud Parameters and Evaluation.

PREVIOUS RESEARCH PROJECTS

TEMIS (E.S.A. Data User Program): Tropospheric Emission Monitoring Internet Service. The aim of the project is the delivery of tropospheric trace gas concentrations, and aerosol and UV products, derived from observations of the nadir-viewing satellite instruments GOME and SCIAMACHY.

TROPOSAT (EUROTRAC-2 subproject): The Use and Usability of Satellite Data for Tropospheric Research. Retrieval of Aerosol Load and Profile from Space.

GASTRAN (A.S.I. project): Aerosol, clouds and trace gases retrieval using ERS-2 and ENVISAT satellite.

RELEVANT EXPERIENCE

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| Oct. 2007 | Presentation: “ <i>Retrieval of desert dust from visible and infrared SEVIRI data.</i> ” A-train Symposium, Lille, France. |
| Sept. 2007 | Presentation: “ <i>Retrieval of aerosol properties from SEVIRI using visible and infrared channels.</i> ” Eumetsat-AMS conference 2007, Amsterdam, Netherlands. |
| Sept 2007 | Presentation: “ <i>Desert dust retrieval from visible and infrared SEVIRI data.</i> ”, RMetS Conference 2007, Edinburgh, UK. |
| June 2007 | Participation at UKAAN workshop: “Air Quality to Climate Change: Implications to and for Aerosols” Agriculture building, University of Reading, Reading, UK. |
| March 2007 | Presentation: “ <i>Dust aerosol retrievals from SEVIRI and AATSR</i> ”, SAMUM-1 data analysis meeting, Mainz, Germany. |
| Jan-March 2007 | Supervisor at MPhys project of Maksym Shostak: “ <i>Scattering by non-spherical particles.</i> ” |
| May 2006 | Presentation: “ <i>GlobAEROSOL from Earth Observation - aerosol maps from (A)ATSR and SEVIRI.</i> ” Atmospheric Science Conference ESA-ESRIN Frascati, Italy. |
| April 2006 | Presentation: “ <i>Aerosol optical properties retrieval from visible and</i> |

- infrared: sensitivity analysis.*” EGU 3st General Assembly Vienna, Austria.
- March 2005 Administrator of the Oxford/RAL spring school: “Exploitation of Data from the AURA mission”
- August 2004 Presentation: *High Resolution Fast Imagery (HFRI) mission - Preliminary result and channel definitions*, EUMETSAT Progress Meeting “MTG imaging channels in the solar domain and 3.8 microns for retrieval of cloud and aerosol microphysical properties”.
- April 2004 Presentation: *Aerosol retrieval from GOME data over ocean: a scaling procedure for small cloud fraction*, EGU 1st General Assembly Nice, France.
- December 2003 Presentation: *GOME Aerosol Optical Depth retrieval over ocean: clearing residual clouds impact*, Aerosols in the UTLS workshop, Oxford, UK.
- April 2003 Presentations: - *Biomass burning aerosol retrieved from GOME data over ocean*; - *Uncertainty in molecular scattering measured from nadir viewing satellite in the aerosol retrieval*.
EGS-AGU-EUG Joint Assembly, Nice, France.
- June - July 1997 ACE-2 (Aerosol Characterisation Experiment).
Partecipation with the Radiation and Climate group of the Fisbat Institute (C.N.R). Responsible of the sun-photometric measurements carried out at the Monchique station (Sagres - Portugal) in the frame of the CLEARCOLUMN project.
- October 1996 RAD-I-CAL '96. International Workshop (Garmish-Partenkircher - Germany). Partecipation with the Radiation and Climate group of the Fisbat Institute (C.N.R.).

NATIONAL COURSES

- June 2004 "*Meteorologia in montagna e climatologia in grotta*", organized by National Commission Speleology School of Italian Speleological Society.
- September 1998 "*Introduzione alla Fotochimica*", Chemistry Department G.Ciamician, Universita' degli studi di Bologna.

INTERNATIONAL COURSES

- August 2002: ISSAOS 2002: "International Course Remote Sensing on the Earth's Environment from Terra." at the Scuola Superiore Reiss Romoli (L'Aquila, Italy).
- March 2002 "The Oxford/RAL spring school in Quantitative Earth Observation EO in Earth Radiation and Climate Studies", at Oxford University.
- October 2001 "Course on Inverse Methods in Atmospheric Science" at the Abdus Salam International Center for Theoretical Physics (Trieste - Italy).
- September 2001 "Remote Sensing Course" at CNR-Bologna.
- March 2001 "Advanced Course: Climate change in the mediterranean region - Part I: physical aspects" at the Abdus Salam International Centre for Theoretical Physics (Trieste - Italy).
- October 1999 "School on exploring the atmosphere by remote sensing techniques" at the Abdus Salam International Centre for Theoretical Physics (Trieste - Italy).

WORK EXPERIENCE

- November 2004-currently Postdoctoral research assistant at University of Oxford.

- Department of Physics, Atmospheric, Oceanic & Planetary Physics department, Earth Observation Data Group.
- July 2004-October 2004* ISAC Research grant (Incarico di collaborazione professionale): "MTG imaging channel in the solar domain and in the IR-3.8 mm for retrieval of cloud and aerosol microphysical properties."
- April 2003- June 2004* ISAC Research grant (Assegno di Ricerca): "Retrieval and characterization, of different Biomass Burning Aerosol using nadir satellite.
- January 2003-March 2003* ISAC Research grant (Collaborazione professionale esterna): "Remote sensing of aerosol from GOME and Sciamachy instrument data"
- January 2002-Dec 2002* INFN Research grant (Contratto di ricerca): "Aerosols and clouds study with Sciamachy radiometer"
- January 2001-Dec 2001* INFN Research grant (Incarico di collaborazione coordinata e continuativa): "Aerosols and clouds study with Sciamachy radiometer".
- December 2000* Scientific guide at "Space Lab" show.
- December 1999-Dec. 2000* Fellowship at ISAO (now ISAC) - CNR Institute (Bologna), subject of research: Aerosol and cloud optical properties, supervisor Dr. Rodolfo Guzzi (Atmospheric Remote Sensing group).
- June -July 1999* Meteorology examiner at the Aeronautic Technical Institute (Forlì -Italy).
- December - May 1999* Stage concerning image processing at Datalogic S.P.A.
- November 1998* Teaching course of "Office '95" in Elea S.P.A.
- April - October 1998* Stage at the Fisbat (now ISAC) - CNR (Bologna) Institute, subject of research: Radiative forcing and climatic effects produced by aerosol particles, supervisor Dr. Claudio Tomasi (Radiation and Climatic Effects group).
- April 1998:* Collaboration with I.B.M. Italy as technical assistant during *Futurshow 1998*

PUBLICATION LIST

Peer reviewed and books:

Bulgin, C. E., P. I. Palmer G. E. Thomas, C. P.G. Arnold, E. Campmany, **E. Carboni**, R. G. Grainger, C. Poulsen, R. Siddans, B. N. Lawrence: "Regional and seasonal variations of the Twomey indirect effect as observed by the ATSR-2 satellite instrument", *Geophysical Research Letters*, accepted, 2007.

Thomas G.E., Poulsen C.A., Curier R.L., De Leeuw G., Marsh S.H., **Carboni E.**, Grainger R.G. and Siddans R: "Comparison of AATSR and SEVIRI aerosol retrievals over the Northern Adriatic". accepted by *QJRMS*, 2007.

A. A. Kokhanovsky, F.-M. Breon, A. Cacciari, **E. Carboni**, D. Diner, Nicolantonio, R.G. Grainger, W.M.F. Grey, R. Höller, K.-H. Lee, P. R. J. North, A. Sayer, G. Thomas, W. von Hoyningen-Huene: "Aerosol remote sensing over land: satellite retrieval using different algorithms and instruments" *Atmos. Research*, doi: 10.1016/j.atmosres.2007.02.008, 2007.

Carboni E. "GOME Aerosol Optical Depth retrieval over ocean: clearing up by residual

clouds impact". Atmospheric Environment, Vol 40, 36, 6975-6987, (2006).

Corradini S., **Carboni E.**, Guerrieri L., Lombroso L., Pugnaghi S., Santangelo R.: "One year of AERONET sun-photometric measurements at Lampedusa site: monthly averaged AOT comparison with satellite data and Saharan dust events detection". Optica Pura y Aplicada, vol 37, n3, pp.3247-3251, (2004).

Carboni E. "Aerosol remote sensing from high resolution nadir satellite spectrometer". PhD Thesis on physical modeling for environmental protection, University of Bologna, (2004).

Guzzi R., Di Nicolantonio W., Ballista G. and **Carboni E.** "Aerosol Retrieval by the introduction of New Aerosol Classes and Optical Properties: Methods and Climatology". In 'Sounding the Troposphere from Space: A New Era for Atmospheric Chemistry' (Borrell P., Borrell P.M., Burrows J.P. and Platt U.), pp.65-76, Springer Verlag, Heidelberg, (2003) .

Guzzi R., Ballista G., Di Nicolantonio W., **Carboni E.**;"Aerosol Maps from GOME Data". Atmospheric Environment, vol.35,pp. 5079-5091 (2001).

Conference contributions:

Carboni E., Thomas G., Grainger R., Poulsen C, Siddans R., Peters D., Campmany E., Sayer A., Brindley H., "Retrieval of desert dust from visible and infrared SEVIRI data", A-Train Symposium, Lille, 22-25 Oct. 2007

Poulsen C., Siddans R., Latter B., Lawrence B., Grainger R., Thomas G., **Carboni E.**, Campmany E., Watt P., "A new cloud and aerosol climatology from ATSR-2", A-Train Symposium, Lille, 22-25 Oct. 2007

Kokhanovsky, A. F.-M. Breon, **E. Carboni**, D. Diner, W.M.F. Grey, K. Lee, G. Rohen, A. Sayer, W. Von Hoyningen-Huene, G. Thomas, "The determination of aerosol optical thickness over Germany using different satellite algorithms and instruments: an intercomparison study based on spectral top-of-atmosphere measurements of AATSR, MERIS, MISR, MODIS, POLDER, and SCIAMACHY", A-Train Symposium, Lille, 22-25 Oct. 2007

Carboni E., Thomas G., Grainger R., Poulsen C, Siddans R., Peters D., Campmany E., Sayer A., Brindley H., Retrieval of aerosol properties from SEVIRI using visible and infrared channels. Proceedings of EUMETSAT/AMS conference 2007, Amsterdam 24-28 Sept. 2007

Pugnaghi Sergio, Corradini Stefano, Tirelli Cecilia, Gangale Gabriele, Amici Stefania, Buongiorno Maria Fabrizia, **Carboni Elisa**: "On ground TIR camera for volcanic plume detection: sensitivity study on sulphur dioxide and volcanic ash retrieval" IUGG 2007, Perugia, Italy.

A. A. Kokhanovsky, F.-M. Breon, J. P. Burrows, A. Cacciari , **E. Carboni**, D. Diner, W. Di Nicolantonio, R.G. Grainger, W.M.F. Grey, R. Höller, I. L. Katsev, K.-H. Lee, P. R. J. North, A. S. Prikhach, A. Sayer, G. Thomas, W. von Hoyningen-Huene, E. P. Zege: "The determination of aerosol optical thickness over Germany using different satellite algorithms and instruments: an inter-comparison study based on spectral top-of-atmosphere measurements of AATSR, MERIS, MISR, MODIS, POLDER, and SCIAMACHY",

Geophysical Research Abstract, Vol. 9, Abstract of the contributions of the EGU General Assembly 2007, Vienna, Austria, 15-20 April 2007.

Carboni E., Thomas G.E., Grainger R.G., Poulsen C.A., Siddans R.: "Aerosol optical properties retrieval from visible and infrared: sensitivity analysis". Geophysical Research Abstract, Vol. 8, Abstract of the contributions of the EGU General Assembly 2006, Vienna, Austria, 02-07 April 2006.

Carboni E., Di Nicolantonio W, Corradini S., Ballista G., "GOME Aerosol Optical Depth retrieval over ocean: clearing residual clouds impact", Proceedings of Aerosols in the UTLS Workshop, St Hugh's College, University of Oxford, UK, 18th & 19th December 2003, sponsors: UTLS OZONE AND CWVC NERC programmes, pp.10-11, (2004).

Carboni E., Di Nicolantonio W., Corradini S., Ballista G., Lecerf C., Morisi E., Scarpanti S. and Guzzi R.: "Aerosol retrieval from GOME data over ocean: a scaling procedure for small cloud fraction". Geophysical Research Abstract, Vol. 6, Abstract of the contributions of the EGU General Assembly Nice, France., 25-30 April 2004.

Corradini S. , Di Nicolantonio W., **Carboni E.**, Ballista G., Lecerf C., Morisi E., Scarpanti S., Guzzi R., Santangelo R., Pugnaghi S.: "Retrieval of tropospheric aerosol extinction coefficient profile from SCIAMACHY nadir simulated measurements in the Oxygen A-band". Geophysical Research Abstract, Vol. 6, Abstract of the contributions of the EGU General Assembly Nice, France., 25-30 April 2004.

Carboni E., Di Nicolantonio W., Corradini S., Cristofori S., Ballista G., Lecerf C., Scarpanti S., Guzzi R.: "Biomass burning aerosol retrieved from GOME data over ocean". Geophysical Research Abstract, Vol. 5, Abstract of the contributions of the EGS-AGU-EUG Joint Assembly, Nice, France, 06-11 April 2003.

Carboni E., Di Nicolantonio W., Ballista G.: "Uncertainty in molecular scattering measured from nadir viewing satellite in the aerosol retrieval.", Geophysical Research Abstract, Vol. 5, Abstract of the contributions of the EGS-AGU-EUG Joint Assembly, Nice, France, 06-11 April 2003.

Cristofori S., Di Nicolantonio W., **Carboni E.**, Corradini S., Ballista G., Scarpanti S., Lecerf C., Guzzi R.: "Water vapor columnar density retrieval from GOME and SCIAMACHY data", Geophysical Research Abstract, Vol. 5, Abstract of the contributions of the EGS-AGU-EUG Joint Assembly, Nice, France, 06-11 April 2003.

Corradini S., Di Nicolantonio W., Scarpanti S., Cristofori S., **Carboni E.**, Ballista G., Lecerf C., Guzzi R., "Sensitivity and error assessment of aerosol extinction coefficients profile retrieval using multi angle simulated data". Geophysical Research Abstract, Vol. 5, Abstract of the contributions of the EGS-AGU-EUG Joint Assembly, Nice, France, 06-11 April 2003.

Tomasi, C., Vitale, V., Cacciari, A., **Carboni, E.**: "Multiwavelength sun-photometer measurements of background aerosol optical thickness at the Schneefernerhaus Observatory (2665 m) during the RAD-I-CAL 96 intercomparison campaign", Booklet of Proceedings of CIMA-ICAM 1998, 25^a International Conference of Alpine Meteorology, 14-19 September 1998, Torino, Italy, 101-104 (1998).

Technical Reports

Gareth E. Thomas, **Elisa Carboni**, Caroline Poulsen, Richard Siddans, Don Grainger, Brian Kerridge and Celestino Gomez: "Globaerosol: A multi-instrument, long term aerosol dataset from European satellites". The Remote Sensing of Atmospheric Constituents from Space, Combining satellite observations to study atmospheric composition. Report from the Fifth ACCENT-TROPOSAT-2 (AT2) Workshop, Sept 2006.

Thomas G.E., **E. Carboni**, S.H. Marsh, S.M. Dean, R.G. Grainger, C.A. Poulsen, R. Siddans and B.J. Kerridge: "GlobAEROSOL Data User Element: ATSR-2/AATSR Algorithm Theoretical Basis Document". version 2.0 , University of Oxford, UK (2006).

Bizzarri B., **Carboni E**, Di Paola F.,Liberti G.L.: "MTG imaging channels in the solar domain and 3.7 microns for retrieval of cloud and aerosol microphysical properties". EUMETSAT report of study contract EUM/CO/04/1293/RSt, (2004).

Tomasi C., Vitale V., **Carboni E.**, Fuzzi S., Facchini M.C., Agostini P., Cupini E., Pagnutti S, Berico M.; "Aerosol Characterization in Emilian Area and study of the consequent radiative forcing and climate effect". Internal report concerning the collaboration between Fisbat Institute and Enea (1998).

HOBBIES

Ultimate Frisbee Founder of the women's Ultimate Frisbee team in Bologna. Organization of international tournaments in Bologna and participation to several tournaments in Europe. Member of Italian women's national team during 1999-2006. Since 2006 member of the mixed Italian national team (since 2007 captain).

Speleology Since 2003. The principal activities consist of searching for new caves, exploring and measuring new branches of known caves and monitoring the hypogeous climate.

Alpinism Climbing several summits (in Italy and abroad); Climbing instructor at the Italian Alpine Club (CAI) in Bologna (1992-2002).

Oxford 08/11/2007

ELISA CARBONI