

SAURABH ANNADATE

Scuola Superiore Studi Pavia IUSS and University of Urbino, Italy

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Personal Data

PLACE AND DATE OF BIRTH: Jalgaon, Maharastra, India — 8 February 1997



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Education

CURRENT POSITION	PHD IN SUSTAINABLE DEVELOPMENT AND CLIMATE CHANGE IUSS PAVIA AND UNIVERSITY OF URBINO
AUG 2016- MAY 2021	BS-MS PHYSICS WITH MINOR IN DATA-SCIENCE INDIAN INSTITUTE <i>of</i> SCIENCE EDUCATION <i>and</i> RESEARCH, Mohali —Cumulative Performance Index: 8.23/10.0

Awards and Achievements

- I was awarded the **Prime Minister's Research Fellowship (PMRF)** by the Ministry of Education, Government of India.
- Recipient of Innovation in Science Pursuit for Inspired Research (INSPIRE) **Scheme for early attraction of talents for Science (SEATs)** scholarship from **Department of Science and Technology, Government of India (DST)**.
- Qualified Joint Entrance Examination mains and advanced, 2016 conducted by National Testing Agency(NTA), India.
- Recipient of merit-cum-means fellowship at IISER Mohali.
- Recipient of **ERASMUS+** grant by EU programme for mobility traineeship. [certificate](#)

Skills

LINGUISTIC	Fluent in Hindi, English and Marathi, and beginner in Italian
PROGRAMMING	Python, R, MatLab, Fortran, UNIX, and \LaTeX
ATMOSPHERIC MODELLING	FLEXPART, FLEXINVERT+, Weather research and forecasting model(WRF-Chem), Climate data operators(CDO), NetCDF operators(NCO), Igor-pro.
BIG-DATA	Experience in handling and visualization of large data sets. Experience working on super-computer clusters of NOAA and CINECA.
MEASUREMENTS	Hands-on experience in handling CO, NO _x , and ozone measurement instruments.
MACHINE LEARNING	Neural networks , Natural language processing , and SVMs. certificate

Experience in atmospheric modelling

PH.D. PROJECT	<p>EMISSION ESTIMATES OF RADIATIVELY ACTIVE SPECIES AT THE REGIONAL SCALE USING INVERSE MODELLING TECHNIQUES.</p> <p><i>Mentored by</i> — Prof. Michela Maione, UNIVERSITY of URBINO, ITALY</p> <p>I use the analytical Bayesian inversion system to evaluate optimised fluxes of synthetic GHGs at the European country scale, using continuous, high-quality observations from the European observatories combined with footprints obtained using atmospheric transport model(FLEXPART).</p>
PARIS HORIZON EUROPE	<p>ESTIMATION OF EUROPEAN BLACK CARBON FLUXES USING INVERSE MODELLING. link</p> <p><i>Mentored by</i> — Prof. Michela Maione, UNIVERSITY of URBINO, ITALY</p> <p>I am involved in WP7, source attribution of European aerosols, of the PARIS Horizon Europe research project. I am leading the deliverable which aims to estimate European black carbon emission fluxes using top-down methods. I am also developing an optimization algorithm for wet-scavenging coefficients in the wet deposition parametrization scheme in the FLEXPART model.</p>
SUMMER PROJECT	<p>STUDY OF THE BIOGENIC EMISSIONS USING UPDATED TREE COVER IN THE MEGAN MODEL.</p> <p><i>Mentored by</i> — Prof. Vinayak Sinha, INDIAN INSTITUTE of SCIENCE EDUCATION and RESEARCH, Mohali</p> <p>There are a lot of discrepancies in actual tree cover over India and the one MEGAN(Model of Emissions of Gases and Aerosols from Nature) model used in the WRF-Chem setup. Trees significantly impact land-atmosphere feedback through evapotranspiration, photosynthesis, and isoprene emissions. We replaced the existing tree cover with the newly created tree cover dataset(at 0.1 degree horizontal resolution) improving isoprene emissions, planetary boundary layer height, and 2m temperature fields in the model.</p>
MS THESIS	<p>A MODELLING STUDY USING WRF-CHEM OVER NORTH INDIA WITH IMPROVED TRANSPORT AND WASTE BURNING EMISSIONS. link</p> <p><i>Mentored by</i> — Prof. Vinayak Sinha, INDIAN INSTITUTE of SCIENCE EDUCATION and RESEARCH, Mohali</p> <p>Anthropogenic emissions can affect the local, regional, and global air quality and climate considerably. The road transport and waste-burning sectors are the major contributors to anthropogenic emissions in India. In this work, we studied road transport and open waste burning emissions using the WRF-Chem regional transport model. We incorporated new road transport and waste-burning emission inventories over India in the WRF-Chem setup.</p>

Publications

1. ANNADATE, S., FALASCA, S., CESARI, R., GIOSTRA, U., MAIONE, M., AND ARDUINI, J. A Sensitivity Study of a Bayesian Inversion Model Used to Estimate Emissions of Synthetic Greenhouse Gases at the European Scale. *Atmosphere* 15, 1 (Jan. 2024), 51. Number: 1 Publisher: Multidisciplinary Digital Publishing Institute [link](#)
2. HAKKIM, H., KUMAR, A., ANNADATE, S., SINHA, B., AND SINHA, V. RTEII: A new high-resolution ($0.1^\circ \times 0.1^\circ$) road transport emission inventory for India of 74 speciated NMVOCs, CO, NO_x, NH₃, CH₄, CO₂, PM_{2.5} reveals massive overestimation of NO_x and CO and missing nitromethane emissions by existing inventories. *Atmospheric Environment: X* 11 (Oct. 2021), 100118 [link](#)
3. SHARMA, G., ANNADATE, S., AND SINHA, B. Will open waste burning become India's largest air pollution source? *Environmental Pollution* 292 (2022), 118310. Publisher: Elsevier [link](#)

Conferences

APRIL 2024	EUROPEAN GEOSCIENCES UNION(EGU) GENERAL ASSEMBLY, VIENNA, AUSTRIA. session Title: Estimates of HFC-134a Emissions over Europe informed by observations show a recent increase.
JUNE 2023	GEIA : GLOBAL EMISSIONS INITIATIVE 20TH CONFERENCE, BRUSSELS, BELGIUM (POSTER PRESENTATION). Title: Long-term emission estimates of radiatively active species at the regional scale using inverse modelling techniques.
MAY 2023	ADVANCED GLOBAL ATMOSPHERIC GASES EXPERIMENT (AGAGE) 67TH MEETING, CNR BOLOGNA, ITALY (ORAL PRESENTATION). Title: Recent decrease in the HFC-134a emissions estimates over Italy: A top-down perspective

Co-authored conference contributions

FEB 2024	5TH CONGRESS OF THE ITALIAN ASSOCIATION OF SCIENCE FOR THE ATMOSPHERE AND THE METEOROLOGY, LECCE, ITALY (ORAL PRESENTATION). link Title: MEDUSA-GC/MS solution, the most recent cryotechnology applied to the continuous analysis of climate-altering substances in air samples
JAN 2024	PARIS-HORIZON EU PROJECT ANNUAL MEETING, BRISTOL, UK (ORAL PRESENTATION). Title: Top-down Italian emissions of HFC-134a: 15 years trend and a comparison with the Italian National Inventory Reports.
SEPT 2023	20TH CONGRESS OF ITALIAN CHEMICAL SOCIETY, DIVISION OF ENVIRONMENTAL CHEMISTRY, ISCHIA, ITALY (ORAL PRESENTATION). link Title: Long-term emission estimates of radiatively active species at the regional scale using inverse modelling techniques: Science for Service
APRIL 2023	EUROPEAN GEOSCIENCES UNION(EGU) GENERAL ASSEMBLY, VIENNA, AUSTRIA (ORAL PRESENTATION). abstract

Workshops and training

JUNE 2023	AMIGO WORKSHOP : ATMOSPHERIC CHEMISTRY MODELING, DATA ASSIMILATION, INVERSE MODELING AND MODEL EVALUATION, BIRA-IASB, BELGIUM.
JULY 2022	DARE UK AND CLASS INTERNATIONAL SUMMER SCHOOL 2022, SOUTHAMPTON, UK certificate
MAY 2022	65TH MEETING OF AGAGE SCIENTISTS AND COOPERATING NETWORKS EMPA AKADEMIE – DÜBENDORF, SWITZERLAND
DEC 2021	3RD EUMETSAT/ESA/ECMWF JOINT TRAINING IN ATMOSPHERIC COMPOSITION link
NOV 2021	WORKSHOP ON OPTICAL AEROSOL PROPERTIES BY ITALIAN AEROSOL SOCIETY
JULY 2021	IWAEC : INTENSIVE WORKSHOP ON ATMOSPHERIC AND ENVIRONMENTAL CHEMISTRY
APRIL 2021	MPI WORKSHOP(PARALLEL PROGRAMMING), IISER MOHALI