



Sushant Das

Curriculum Vitae

Education

- 2011-2017 **Ph.D. Atmospheric Sciences**, *Centre for Atmospheric Sciences*, Indian Institute of Technology Delhi, New Delhi, India.
CGPA: 9.14/10
- 2009-2011 **M.Tech. Atmospheric Sciences**, *Centre for Atmospheric Sciences*, Indian Institute of Technology Delhi, New Delhi, India.
CGPA: 9.39/10
- 2007-2009 **M.Sc. Physics**, University of Delhi, New Delhi, India
First Class (65 %)
- 2004-2007 **B.Sc. Physics**, *Ramjas College*, University of Delhi, New Delhi, India
First Class (80.6 %)

Ph.D. Thesis

- Title **Dynamical impacts of aerosols on Indian summer monsoon circulation using Regional Climate Model.**
- Supervisors Prof. Sagnik Dey and Prof. S. K. Dash
Centre for Atmospheric Sciences,
Indian Institute of Technology, Delhi, India
- Submitted Sept, 2016
- Defense June, 2017

Professional Experience

- 06/2023-
Present **Assistant Professor**, Department of Earth and Atmospheric Sciences, National Institute of Technology Rourkela, Odisha, India
- 03/2022-
05/2023 **Researcher**, *Dr. Frida Bender and Dr. Thorsten Mauritsen*, MISU, Stockholm University, Stockholm, Sweden
- 10/2016-
02/2022 **Post-Doc Fellow**, *Prof. Filippo Giorgi and Dr. Erika Coppola*, ESP Section, The Abdus Salam ICTP, Trieste, Italy

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Research Interest

Aerosol-climate Interaction, Monsoon dynamics, Climate modeling, Climate change, tropical meteorology, Air pollution and mitigation, Model tuning and development, machine learning

Memberships

Member of American Geophysical Union
Member of European Geosciences Union

Reviewer

Climate Dynamics, Journal of Geophysical Research Atmospheres, Earth System Dynamics, Atmospheric Environment, Atmospheric Research, Climate Research, International Journal of Climatology, Theoretical and Applied Climatology, Frontiers in Environmental Science, Atmosphere, Indian Journal of Physics

- Invited for Topical Editor in the Atmosphere journal

Scientific Co-ordinator, The Abdus Salam ICTP, Trieste, Italy

Dr. A. S. Panicker, Indian Institute of Tropical Meteorology, Pune, India
Dr. A. S. Gautam, HNB Garhwal University, Srinagar, Uttarakhand, India

Supervision

Marc Norgate (PhD candidate, 2021-Present), University of Hertfordshire, United Kingdom (Co-supervisor)

Supervising visiting students and group projects in the workshops held at The Abdus Salam ICTP, Trieste, Italy

Additional Info

Google Scholar <https://scholar.google.co.in/citations?user=gNilzWkAAAAJ&hl=en>,
h-index: 16,
citations: 721

Publications

- [1] **S. Das**, S. Dey, S. K. Dash, and G. Basil, *Examining mineral dust transport over the Indian subcontinent using the regional climate model, RegCM4.1*, Atmos. Res., **134**, 64–76, (2013). <https://doi.org/10.1016/j.atmosres.2013.07.019>.
- [2] **S. Das**, S. Dey, and S. K. Dash, *Inter-annual variations in natural and anthropogenic aerosol loadings over the seas adjoining India using a hybrid approach*, Atmos. Sci. Lett., **15** (1), 58–64 (2014). <https://doi.org/10.1002/asl2.469>.
- [3] **S. Das**, S. Dey, and S. K. Dash, *Impacts of aerosols on dynamics of Indian summer monsoon using a regional climate model*, Clim. Dyn., **44**, 1685–1697 (2015). <https://doi.org/10.1007/s00382-014-2284-4>.

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- [4] **S. Das**, S. Dey, S.K. Dash, G. Giuliani, and F. Solmon, *Dust aerosol feedback on the Indian summer monsoon: Sensitivity to absorption property*, *J. Geophys. Res. Atmos.*, **120** (18), 9642-9652 (2015). <https://doi.org/10.1002/2015JD023589>.
- [5] **S. Das**, S. Dey, and S. K. Dash, *Direct radiative effects of anthropogenic aerosols on Indian summer monsoon circulation*, *Theor. Appl. Climatol.*, **124**, 629–639 (2016). <https://doi.org/10.1007/s00704-015-1444-8>.
- [6] T. Saud, S. Dey, **S. Das**, and S. Dutta, *A satellite-based 13-year climatology of net cloud radiative forcing over the Indian monsoon region*, *Atmos. Res.*, **182**, 76–86 (2016), <https://doi.org/10.1016/j.atmosres.2016.07.017>.
- [7] A. S. Panicker, K. Sandeep, A. S. Gautam, N. Gandhi, G. Beig, H. C. Nainwal, P. S. P. Rao, P. D. Safai, **S. Das** and V. Waghmare, *Chemical composition and isotopic signatures of ice and snow over a Himalayan Glacier (Satopanth) in India*, *SN Appl. Sci.* **1**, 1166 (2019), <https://doi.org/10.1007/s42452-019-0966-6>.
- [8] A. S. Panicker, K. Sandeep, R. S. Negi, A. S. Gautam, D. S. Bisht, G. Beig, B. S. Murthy, R. Latha, S. Singh and **S. Das**, *Estimates of Carbonaceous Aerosol Radiative Forcing over a Semiurban Environment in Garhwal Himalayas*, *Pure Appl. Geophys.* **176**, 5069–5078 (2019), <https://doi.org/10.1007/s00024-019-02248-7>.
- [9] K. Sandeep, R. S. Negi, A. S. Panicker, A. S. Gautam, D. S. Bhist, G. Beig, B. S. Murthy, R. Latha, S. Singh and **S. Das**, *Characteristics and Variability of Carbonaceous Aerosols over a Semi Urban Location in Garhwal Himalayas*, *Asia-Pacific J Atmos Sci* **56**, 455–465 (2020), <https://doi.org/10.1007/s13143-019-00158-1>.
- [10] A. K. Mishra, S. Dwivedi, **S. Das**, *Role of Arabian Sea warming on the Indian summer monsoon rainfall in a regional climate model*, *Int. J. Climatol.* **40**, 2226–2238 (2020), <https://doi.org/10.1002/joc.6328>.
- [11] **S. Das**, F. Giorgi, G. Giuliani, S. Dey, and E. Coppola, *Near-future anthropogenic aerosol emission scenarios and their direct radiative effects on the present-day characteristics of the Indian summer monsoon*. *J. Geophys. Res. Atmos.*, **125** (4), e2019JD031414 (2020). <https://doi.org/10.1029/2019JD031414>.
- [12] **S. Das**, F. Giorgi and G. Giuliani, *Investigating the relative responses of regional monsoon dynamics to snow darkening and direct radiative effects of dust and carbonaceous aerosols over the Indian subcontinent*. *Clim. Dyn.* **55**, 1011-1030 (2020), <https://doi.org/10.1007/s00382-020-05307-1>.
- [13] M. Ashfaq, T. Cavazos, M. S. Reboita, J. A. Torres-Alavez, E. S. Im, C. F. Olusegun, L. Alves, K. Key, M. O. Adeniyi, M. Tall, M. B. Sylla, S. Mehmood, Q. Zafar, **S. Das**, I. Diallo, E. Coppola and F. Giorgi, *Robust late twenty-first century shift in the regional monsoons in RegCM-CORDEX simulations*. *Clim Dyn* **57**, 1463–1488 (2021), <https://doi.org/10.1007/s00382-020-05306-2>.
- [14] R. H. Glazer, J. A. Torres-Alavez, E. Coppola, F. Giorgi, **S. Das**, M. Ashfaq, T. Sine, *Projected changes to severe thunderstorm environments as a result of twenty-first century warming from RegCM CORDEX-CORE simulations*. *Clim Dyn* **57**, 1595–1613 (2021), <https://doi.org/10.1007/s00382-020-05439-4>.

- [15] J. Ciarlo, E. Coppola, A. Fantini, F. Giorgi, X. Gao, Y. Tong, R. H. Glazer, J. A. T. Alavez, T. Sines, E. Pichelli, F. Raffaele, **S. Das**, M. Bukovsky, M. Ashfaq, E.-S. Im, T. N.-Xuan, C. Teichmann, A. Remedio, T. Remke, K. Bülow, T. Weber, L. Bunttemeyer, K. Sieck, D. Rechid, D. Jacob, *A new spatially distributed added value index for regional climate models: the EURO-CORDEX and the CORDEX-CORE highest resolution ensembles*. *Clim Dyn* **57**, 1403–1424 (2021), <https://doi.org/10.1007/s00382-020-05400-5>.
- [16] E.-S. Im, N. X. Thanh, L. Qiu, M. Ashfaq, X. Gao, T. Yao, C. Torma, M. Adeniyi, **S. Das**, G. Giuliani, E. Coppola, F. Giorgi. *Emergence of robust anthropogenic increase of heat stress-related variables projected from CORDEX-CORE climate simulations*. *Clim Dyn* **57**, 1629–1644 (2021), <https://doi.org/10.1007/s00382-020-05398-w>.
- [17] C. Teichmann, D. Jacob, A. R. Remedio, T. Remke, L. Bunttemeyer, P. Hoffmann, A. Kriegsmann, L. Lierhammer, K. Bülow, T. Weber, K. Sieck, D. Rechid, G. S. Langendijk, E. Coppola, F. Giorgi, J. Ciarlo, F. Raffaele, G. Giuliani, G. Xuejie, T. R. Sines, J. A. T. Alavez, **S. Das**, F. di Sante, E. Pichelli, R. Glazer, M. Ashfaq, M. Bukovsky, E.-S. Im. *Assessing mean climate change signals in the global CORDEX-CORE ensemble*. *Clim Dyn* **57**, 1269–1292 (2021), <https://doi.org/10.1007/s00382-020-05494-x>.
- [18] P. Maharana, D. Kumar, **S. Das**, P. R. Tiwari. *Present and future changes in precipitation characteristics during Indian Summer Monsoon in CORDEX-CORE simulations*. *Int. J. Climat.* **41** 2137–2153 (2020), <https://doi.org/10.1002/joc.6951>.
- [19] A. S. Panicker, V. A. Kumar, M. P. Raju, G. Pandithurai, P. D. Safai, G. Beig, **S. Das**. *CCN activation of carbonaceous aerosols from different combustion emissions sources: A laboratory study*. *Atm. Res.* **248** (2020), *Atmospheric Research* **248**, 105252 (2021), <https://doi.org/10.1016/j.atmosres.2020.105252>.
- [20] A. S. Panicker, K. Sandeep, A. S. Gautam, H. K. Trimbake, H. C. Hainwal, G. Beig, D. S. Bisht, **S. Das**. *Black carbon over a central Himalayan Glacier (Satopanth): Pathways and direct radiative impacts*. *Sci. Total Environ.* **766**, 144242 (2021), <https://doi.org/10.1016/j.scitotenv.2020.144242>.
- [21] A. Torres, **S. Das**, A. C.-Suastegui, E. Coppola, F. Giorgi, F. Raffaele, M. S. Bukovsky, M. Ashfaq, J. A. Salinas, T. Sines. *Future projections in the climatology of global low-level jets from CORDEX-CORE simulations*. *Clim Dyn* **57**, 1551–1569 (2021). *Clim Dyn* **57**, 1551–1569 (2021). <https://doi.org/10.1007/s00382-021-05671-6>.
- [22] E. Coppola, F. Raffaele, F. Giorgi, G. Giuliani, G. Xuejie, J. Ciarlo, T. Sines, A. Torres, **S. Das** et al. *Climate hazard indices projections based on CORDEX-CORE, CMIP5 and CMIP6 ensemble*. *Clim Dyn* **57**, 1293–1383 (2021), <https://doi.org/10.1007/s00382-021-05640-z>.
- [23] N. K. Shahi, **S. Das**, S. Ghosh et al. *Projected changes in the mean and intra-seasonal variability of the Indian summer monsoon in the RegCM CORDEX-CORE simulations under higher warming conditions*. *Clim Dyn* **57**, 1489–1506 (2021), <https://doi.org/10.1007/s00382-021-05771-3>.

- [24] A. Torres, R. Glazer, F. Giorgi, E. Coppola, X. Gao, K.I. Hodges, **S. Das**, M. Ashfaq, M. Reale, T. Sines. *Future projections in tropical cyclone activity over multiple CORDEX domains from RegCM4 CORDEX-CORE simulations*. *Clim Dyn* **57**, 1507-1531 (2021). <https://doi.org/10.1007/s00382-021-05728-6>.
- [25] **S. Das**, F Giorgi, E. Coppola et al., *Linkage between the absorbing aerosol-induced snow darkening effects over the Himalayas-Tibetan Plateau and the pre-monsoon climate over northern India*. *Theor Appl Climatol* **147**, 1033-1048 (2022), <https://doi.org/10.1007/s00704-021-03871-y>
- [26] F. Giorgi, E. Coppola, D. Jacob, C. Teichmann, S.A. Omar, M. Ashfaq, N. Ban, K. Bulow, M. Bukovsky, L. Buntemeyer, T. Cavazos, J. Ciarlo, R. p. Da Rocha, **S. Das**, et al., *The CORDEX-CORE EXP-I initiative: Description and highlight results from the initial analysis*. *Bulletin of the American Meteorological Society* **103(2)**, E293-E310 (2023). <https://doi.org/10.1175/BAMS-D-21-0119.1>.
- [27] A. K. Mishra, A. K. Dubey and **S. Das**, *Identifying the changes in winter monsoon characteristics over the Indian subcontinent due to Arabian Sea warming*. *Atmospheric Research* **273**, 106162 (2022). <https://doi.org/10.1016/j.atmosres.2022.106162>.
- [28] A. K. Mishra, S. Dwivedi and S. Das, *Sensitivity of the Indian Summer monsoon rainfall to land surface schemes and model domain in a regional climate model 'RegCM'*. *Clim Dyn* (2022). <https://doi.org/10.1007/s00382-022-06636-z>.
- [29] S. Ghosh, S. Dey, **S. Das** et al., *Towards an improved representation of carbonaceous aerosols over the Indian monsoon region in a regional climate model RegCM* *Geo. Model Dev discussion* (2023).
- [30] M. Pant, R. Bhatla, S. Ghosh, **S. Das**, R.K. Mall, *Will Warming Climate Affect the Characteristics of Summer Monsoon Rainfall and Associated Extremes Over the Gangetic Plains in India?* *Earth and Space Science* (2023).
- [31] S. Ghosh, A.J. Miller, A. C. Subramaniam, R. Bhatla, **S. Das**, R.K. Mall, *Signals of northward propagating monsoon intraseasonal oscillations (MISOs) in the RegCM4.7 CORDEX-CORE simulation over South Asia domain* *Climate Dynamics* (2023).

Conference/workshop Proceedings (selected)

- M. Norgate, P. R. Tiwari, **S. Das**, D. Kumar, *On the present and future changes in heat waves over India in coupled climate models* EGU General Assembly 2023.
- **S. Das**, *Aerosol Climate Interaction in RegCM*, 10th ICTP Workshop on the Theory and Use of Regional Climate Models, ICTP, Trieste, Italy online 8-12, Nov 2021.
- **S. Das**, E. Coppola, A. S. Panicker, and S. S. Gautam, *Linkage between the absorbing aerosol snow darkening effects over the Himalayas-Tibetan Plateau and the pre-monsoon climate over northern India*, EGU General Assembly 2021, online, 19–30 Apr 2021, EGU21-10308, <https://doi.org/10.5194/egusphere-egu21-10308>.
- **S. Das**, A. Torres, A. Corrales, E. Coppola, F. Giorgi, F. Raffaele, M. Bukovsky, M. Ashfaq, and T. Sines, *Future projections in the climatology of five low-level jets across different CORDEX domains*, EGU General Assembly 2020, Online, 4–8 May 2020, <https://doi.org/10.5194/egusphere-egu2020-18411>.

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- **S. Das**, F. Giorgi, G. Giuliani, S. Dey and E. Coppola, *Heterogeneity in regional responses of Indian summer monsoon to short-lived anthropogenic aerosol emission scenarios*, 21th EGU General Assembly 2019, Vienna, Austria, 7-12 April 2019, <https://meetingorganizer.copernicus.org/EGU2019/EGU2019-4081.pdf>
- **S. Das**, E. Coppola and F. Giorgi, *Examining the Added Value in Down-scaling Precipitation Characteristics over India using a Regional Climate Model*, 20th EGU General Assembly 2018, Vienna, Austria, 4-13 April 2018, <https://meetingorganizer.copernicus.org/EGU2018/EGU2018-15809.pdf>.
- **S. Das**, S. Dey, and S. K. Dash, *Study of mineral dust transport over the Indian subcontinent using regional climate model RegCM4.1*, IASTA 2012, Conference of Indian Aerosol Science and technology Association, Mumbai, 11-13th Dec. 2012. (Oral).
- **S. Das**, S. Dey, and S. K. Dash, *Modeling direct effects of Anthropogenic aerosols on the Indian summer monsoon circulation*, 1st climate science and policy workshop, Mumbai, 6-7th March 2014 (Poster).
- **S. Das**, S. Dey, and S. K. Dash, *Response of Atmospheric Circulations to Direct Radiative Forcings of Aerosols over the Indian subcontinent*, 7th ICTP Workshop on "The Theory and Use of Regional Climate Models", ICTP, Trieste Italy. 12-23rd May 2014 (Oral).
- **S. Das**, S. Dey, and S. K. Dash, *Modelling direct impacts of aerosols on the dynamics of two contrasting Indian summer monsoon seasons*, IASTA 2014, Conference of Indian Aerosol Science and technology Association (303-306), Varanasi, 11-13th November 2014 (Poster).
- **S. Das**, S. Dey, and S. K. Dash, *Direct impacts of aerosols on two successive contrasting Indian summer monsoon seasons using a regional climate model*, AGU Fall Meeting 2014, San Francisco USA, 14-19th December 2014 (Poster).
- **S. Das**, S. Dey, and S. K. Dash, *Examining direct impacts of anthropogenic aerosols on Indian summer monsoon using a regional climate model*, International workshop on climate change on "Assessing the Impact of Aerosols & Changing Climate on Monsoon & Extreme Events", 12-15 January 2015, Ansal University, Gurgaon (Poster).
- **S. Das**, G. Jayaraman, B. Kumari, *Multivariate statistical analysis of the seasonal variation of chlorophyll distribution in the north Indian ocean*, Proc. of the sixth International Conf. on Asian and Pacific coasts, Hong Kong, China 2011, pp 1054-1061.
- S. Dey, K. Sengupta, G. Basil, **S. Das**, Nidhi, S.K. Dash. A. Sarkar, P. Srivastava, A. Singh, P. Agarwal, *Satellite-based 3D structure of cloud and aerosols over the Indian Monsoon region: implications for aerosol-cloud interaction*, Proc. SPIE 8529, Remote Sensing and Modeling of the Atmosphere, Oceans, and Interactions IV, 852907-(1-10), Kyoto, Japan, November 8, 2012.

Workshop/School Attended

- 10th ICTP Workshop on "The Theory and Use of Regional Climate Models", The Abdus Salam ICTP, Trieste Italy, 8th-12th November, 2021.

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- Workshop on “Paper-writing Workshop on the Analysis of CORDEX-CORE Climate Projections”, The Abdus Salam ICTP, Trieste Italy, 6th-10th May, 2019.
- 9th ICTP Workshop on “The Theory and Use of Regional Climate Models”, The Abdus Salam ICTP, Trieste Italy, 28th May-8th June, 2018.
- 8th ICTP Workshop on “The Theory and Use of Regional Climate Models”, The Abdus Salam ICTP, Trieste Italy, 23rd May-3rd June, 2016.
- Workshop on “Wildfires and their Environmental Impacts”, The Abdus Salam ICTP, Trieste Italy, 22nd-26th June, 2015.
- 7th Workshop on “The Theory and Use of Regional Climate Models”, The Abdus Salam ICTP, Trieste Italy, 12th-23rd May, 2014.
- 2nd DST training workshop on Climate Modeling: Simulations and Analysis, Indian Institute of Technology Delhi, India, 23rd June-14 July 2014. Participated and assisted as a teaching assistant.
- SERC School on Dynamics and Forecasting of the Indian Summer Monsoon by Department of Science & Technology, Govt. of India, Indian Institute of Technology Delhi, India, 27th June-20th July, 2011.
- Training program in International School on Applications with the newest Multi-spectral Environmental Satellites, India Meteorological Department, New Delhi India, 30 January-5 February, 2011
- 5th SERC School on Aviation Meteorology, Coimbatore India, 7-28 December, 2009.

Awards and Honours

- Best group project in the 10th ICTP Workshop on the Theory and Use of Regional Climate model held during 8-12 Nov, 2021 (online mode) at The Abdus Salam ICTP, Trieste Italy. Role- group leader for the South Asia CORDEX domain.
- The Abdus Salam ICTP travel award to participate in the 7th & 8th ICTP Workshop on “The Theory and Use of Regional Climate Models” held during 12-23 May, 2014 and 23 May - 3 June, 2016 respectively at The Abdus Salam ICTP, Trieste Italy.
- The Abdus Salam ICTP travel award to participate in workshop on “Wildfires and their Environmental Impacts”, held during 22-26 June, 2015 at The Abdus Salam ICTP, Trieste Italy.
- Faculty Alumni Network (FAN) travel grant to participate in FAN meeting held during 15-16 January, 2015 at Goa, India.
- American Geophysical Union (AGU) Student Travel Grant to attend AGU Fall meeting held during 15-19 December 2014 at San Francisco, USA.
- 2nd Best Paper Award in conference of Indian Aerosol Science and Technology Association (IASTA-2014) conference held during 11-13 November 2014 at Varanasi, India.
- 3rd Best Paper Award in conference of Indian Aerosol Science and Technology Association (IASTA-2012) conference held during 11-13 December 2012 at Mumbai, India.

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- Awarded Senior Research Fellowship (CSIR-SRF) by Council of Scientific and Industrial Research, Government of India, January 2012-December 2014.
- Secured 1st position in M.Tech course at Centre for Atmospheric Sciences, IIT Delhi.
- Awarded Junior Research Fellowship (CSIR-JRF) by Council of Scientific and Industrial Research, Government of India, January 2010-December 2011.
- Qualified (CSIR-JRF-NET)-June 2009 Examination in Physical Sciences with all India Rank 97 organized by the Council of Scientific and Industrial Research (CSIR) and University Grant Commission (UGC) under the Eligibility for Junior Research Fellowship (JRF) and Lectureship (NET).
- Qualified Graduate Aptitude Test in Engineering (GATE-2009) organized by the Ministry of Human Resources and Development, Government of India and Joint Entrance Screening Test (JEST-2009) in Physics.
- Secured 4th position in BSc Physics (H) course in Ramjas College, University of Delhi.

Computational Skills

- **Operating systems handled:** Unix, Linux, Windows.
- **Hands on supercomputing clusters:** Marconi (CINECA, Italy), Rhea (ORNL, USA), LUMI (CSC, Finland), Tetralith (Stockholm Uni. Sweden), DKRZ (Germany), Argo (ICTP, Italy), Ajaymeru and Chandra (IIT Delhi).
- **Programming languages:** Fortran, shell scripting, python3.
- **Models:** RegCM, ICON (Limited), WRF (Limited).
- **Softwares:** GrADS, CDO, NCO, NCL.
- **Data handling:** NetCDF, Grib, ASCII.
- High performance computing.

Outreach Activities

- Volunteer in Open House Day held at Centre for Atmospheric Sciences, Indian Institute of Technology Delhi, India during April for all the years from 2010 to 2014.
- Volunteer in data collection for Indo-Japan International Collaborative Research Project during March 2010.

Declaration

I hereby declare that all the information furnished above is true to the best of my knowledge.

Sushant Das

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