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**Area of Research:** Lower Atmospheric Studies

**Research Interests:** Aerosols, Clouds, Boundary Layer, Radiation, Surface atmosphere coupling processes, Trace gases: CO<sub>2</sub>, H<sub>2</sub>O etc

**Techniques/Instrumentation used:** Satellite remote sensing, Eddy covariance system, GPS sonde, Micro-meteorological observations

**Educational Qualification**

B Sc: Mathematics, Physics, Statistics : 1993-1996  
VTM NSS college, Trivandrum

M Sc: Meteorology, CUSAT, Cochin: 1997-1999

PhD: Atmospheric Science, CUSAT, Cochin: 2006

**Title of thesis:** Investigations on the spatial distribution and transport of aerosols over the oceanic regions around the Indian subcontinent using satellite remote sensing

**Professional background**

2000-2002: Junior Research Fellow, Space Physics Laboratory, VSSC

2003-2005: Senior Research Fellow, Space Physics Laboratory, VSSC

2006 May-2008 January: Post Doctoral Fellow, Space Physics Laboratory, VSSC

2008 February-2014 June: Scientist-SD, Space Physics Laboratory, VSSC

2014 July-Till date: Scientist-SE, Space Physics Laboratory, VSSC

## **Publications**

1. **Sandhya K. Nair**, Thara V. Prabha, N. Purushothaman, S. Sijikumar, S. Muralidharan, N. V. P. Kirankumar, D. B. Subrahmanyam, T. J. Anurose, S. S. Prijith and K.V. S. Namboodiri, “Diurnal variations of the low-level jet over peninsular India during the onset of Asian summer monsoon”, *Theoretical and Applied Climatology* 120(1): 287 - 298, 2015.
2. RK Mehajan, N Ravi, **Sandhya K Nair** and MS Madhusoodanan, On the highly localised convective systems over Jodhpur, *Vatavaran*, Vol.39, issue 1, page 1-14, June 2015.
3. S. S. Prijith, K. Rajeev, Bijoy V. Thampi, **Sandhya K Nair**, Mannil Mohan, Multi-year observations of spatial and vertical distribution of aerosols and genesis of the abnormal variations in aerosol loading over the Arabian Sea during Asian Summer Monsoon Season, ***Journal of Atmospheric and Solar-Terrestrial Physics***, 2013.
4. Anurose T J, D B Subrahmanyam , C B S Dutt , N V P Kiran Kumar, S R John, **Sandhya K Nair**; M Santhosh, M. Mohan, P K Kunhikrishnan , S Sijikumar , S S Prijith, Vertical Structure of Sea-Breeze Circulation over Thumba (8.5°N, 76.9°E) during W-ICARB Field Experiment: A Case Study, ***Meteorology and Atmospheric Physics***, 2012.
5. **Sandhya K. Nair**, S. Sijikumar and S.S. Prijith, Impact of Continental meteorology and atmospheric circulation in the modulation of Aerosol Optical Depth over the Arabian Sea, ***Journal of Earth System Science*** ,121, No. 2, , pp. 263–272,2012
6. **Sandhya K. Nair**, T. J. Anurose, D. B. Subrahmanyam, N. V. P. Kiran Kumar, M. Santosh, S. Sijikumar, M. Mohan, and K. V. S. Namboodiri , Characterization of the Vertical Structure of Coastal Atmospheric Boundary Layer over Thumba (8.5°N, 76.9°E) during Different Seasons ,Volume 2011, Article ID 390826, 9pages,doi:10.1155/2011/390826, ***Advances in Meteorology***, 2011.
7. Rajeev K, K. Parameswaran, **Sandhya K. Nair** and S. Meenu, Observational evidence for the radiative impact of Indonesian smoke in modulating the sea surface temperature of the equatorial Indian Ocean, ***Journal of Geophysical Research***, 113, D17201, doi:10.1029/2007JD009611, 2008.
8. Parameswaran K, **Sandhya K. Nair** and K. Rajeev, Impact of aerosols from the Asian Continent on the adjoining Oceanic Environments, ***Journal of Earth System Science***, 17,83-102,2008.
9. K. Parameswaran, **Sandhya K Nair**, and K. Rajeev, Spatial distribution of sea-salt and non-sea-salt aerosol optical depths over the oceanic regions around the Indian subcontinent from space borne measurements, ***Journal of Marine and Atmospheric Research***, Vol.3, 2007.
10. **Sandhya K. Nair**, K. Parameswaran and K. Rajeev, Seven-years satellite observations of the mean structure and variabilities in the regional aerosol distribution over the oceanic areas around the Indian subcontinent, ***Annales Geophysicae.***, 23, 2011–2030, 2005.
11. **Sandhya K. Nair**, K. Rajeev and K. Parameswaran, Cloud screening in IRS-P4 OCM satellite data: potential of spatial coherence method in the absence of thermal channel information, ***Remote Sensing of Environment***, 90, 259-267, 2004.
12. K. Rajeev, **Sandhya K Nair**, K. Parameswaran, and C. Suresh Raju, Satellite observations of the regional aerosol distribution and transport over the Arabian Sea,

Bay of Bengal, and Indian Ocean, **Indian Journal of Marine Sciences**, 33, 11-29,2004.

13. K. Parameswaran, **Sandhya K. Nair** and K. Rajeev, Impact of Indonesian forest fires during the 1997 El Niño on the aerosol distribution over the Indian ocean, **Advances in Space Research**, 33(7), 1098-1103, DOI 10.1016/S0273-1177 (03) 00736-1, 2004
14. **Sandhya K. Nair**, K. Rajeev, and K. Parameswaran, Wintertime regional aerosol distribution and the influence of continental transport over the Indian Ocean, **Journal of Atmospheric and Solar Terrestrial Physics**, 65, 149-165, 2003.
15. K. Rajeev, **Sandhya K. Nair**, and K. Parameswaran, Seasonal and inter-annual variability of regional aerosol distribution over the Indian Ocean observed using NOAA-14 AVHRR, Ocean Optics: Remote sensing and underwater imaging, Eds. R. J. Fouin, G. D. Gilbert, **Proceedings of SPIE**, 4488, 238-247, 2002.

### **Proceedings**

1. **Sandhya K. Nair** and Manoj Kumar Mishra, Direct observations of short-wave cloud radiative forcing at earth's surface over Trivandrum, Proceedings of the project review meeting, 8-9 January 2014.
2. D B Subrahmanyam, N.V.P. Kiran Kumar, C.B.S. Dutt, T.J. Anurose, P.K. Kunhikrishnan, M Mohan, S R John, S.S. Prijith, S. Indira Rani, S. Sijikumar, **Sandhya K. Nair**, M. Santosh Denny P. Alappattu, Marina Aloysius, S. Satyanarayana and R. Gopakumar, "Marine Atmospheric Boundary Layer (MABL) Characteristics over the Bay of Bengal during W-ICARB Field Experiment", *Proc. Project Review Meeting, ARFI & ICARB Scientific Progress Report – 2010*, Trivandrum, 9-10 June 2010, 120-133, 2010.
3. N.V.P. Kiran Kumar, P.K. Kunhikrishnan, D. B. Subrahmanyam, M Mohan., C.B.S. Dutt, M Santosh, S.S. Prijith, S. Indira Rani, S. Sijikumar, **Sandhya K. Nair**, Denny P. Alappattu, Marina Aloysius, S. Satyanarayana and R. Gopakumar, "Structure of Thermal Internal Boundary Layer over Thumba during W-ICARB campaign: A case study", *Proc. of the Project Review Meeting, ARFI & ICARB Scientific Progress Report – 2010*, Thiruvananthapuram, 9-10 June 2010., 161-167, 2010.
4. **Sandhya K Nair** and P V. Joseph, Relationship between Indian summer monsoon rainfall and northwest Pacific cyclones during the period June to September, Proceedings of Tropmet 2000, 266-271, February 2000.
5. **Sandhya K. Nair**, K. Rajeev and K. Parameswaran, Regional aerosol distribution and transport over the Bay of Bengal during the winter months of 1996- 1999, Proceedings of Tropmet 2001, 577-584, February, 2001.
6. K. Rajeev, **Sandhya K. Nair**, and K. Parameswaran, Influence of synoptic circulation on aerosol loading over the Indian Ocean, IASTA Bulletin, 14, 59-62, 2002
7. K. Parameswaran, **Sandhya K. Nair** and K. Rajeev, Space borne observations of the effect of Indonesian forest fires on the aerosol loading over Indian Ocean, IASTA Bulletin, 14, 47-50, 2002.
8. **Sandhya K Nair**, K. Rajeev, and K. Parameswaran, "Seven-years satellite observations of the mean structure and variabilities of regional aerosol distribution over the oceanic areas around the Indian subcontinent", *Proc. of IASTA*, Vol.16, 150-154, 2004.
9. Rajeev, K, **Sandhya K Nair** and K Parameswaran, Radiative impact of aerosols over the Arabian Sea, Bay of Bengal and Indian Ocean during the Asian summer monsoon

- and Asian dry seasons, Proceedings of the 4<sup>th</sup> Asian Aerosol conference (AAC-2205), IASTA Bulletin, ISSN 0971-4510, 17, 2005.
10. **Sandhya K Nair**, K Rajeev and K Parameswaran, Pathways of aerosol transport over the Arabian Sea, Bay of Bengal and Indian Ocean during the Asian dry and summer monsoon seasons, IASTA Bulletin, 2005.
  11. **Sandhya K Nair**, K. Rajeev, and K. Parameswaran, Inter-annual variability in the short-wave aerosol direct radiative forcing over the oceanic areas around the Indian subcontinent during Dry Season, **Proceeding of SPIE**, doi.10.1117/12.694027, 6408, 2006
  12. K. Rajeev, K. Parameswaran, **Sandhya K Nair**, S. Meenu, A case study on the impact of atmospheric aerosols in modifying the regional meteorology, emerging trends in aerosols: Technology & Applications, **18**, Nos 1&2, 363-366, IASTA Bulletin, November, 2007.

### **Technical Report**

1. **Sandhya K.Nair**, R.Satheesh Thampi, Sreekanth Vakacherla and Abhilash, A plausible method for forecasting wind structure during launch campaign with the aid of GPS radiosonde observational data and a numeric atmospheric model, IITP Training Project Report, ISRO-VSSC-TR-0155-0-08, 2008.

### **Presentation in Symposia/ Conference**

1. **Sandhya K. Nair**, 'Asia flux meet-2015', Challenges and significance of ecosystem research to better understand climate change" on 22-29 November 2015 at Indian Institute of Tropical Meteorology, Pune.
2. **Sandhya K. Nair**, Thara V. Prabha, N Purushothaman, S. Sijikumar, S. Muralidharan, N.V.P. Kirankumar, D.B.Subrahmanyam and T.J.Anurose, S.S.Prijith and K.V.S.Namboodiri, International Conference on Climate Change and Disaster Management, Thiruvananthapuram, February 26-28, 2015.
3. **Sandhya.K.Nair**, Manoj Kumar Mishra, and K. Rajeev: Cloud Radiative Forcing at Surface during the Asian Summer Monsoon Season at a Coastal Station in the Southwest Peninsular India, COSPAR Scientific Assembly, Mysore, 15-20 July, 2012
4. **Sandhya.K.Nair** and Thara Prabhakaran, Diurnal structure of low-level jet characteristics during the monsoon onset over Kerala, OCHAMP-2012,
5. **Sandhya.K.Nair**, Manoj Kumar Mishra, and K. Rajeev, Direct observations of the Cloud Radiative Forcing at Earth's Surface, NSSS-2012,
6. Prijith S.S, **Sandhya K. Nair**, Mannil Mohan and K. Rajeev, Genesis of the anomalies in dust loading over the Arabian Sea during Summer Monsoon Season, NSSS-2012
7. Rajeev K, K. Parameswaran, **Sandhya.K.Nair** and S. Meenu, Observational evidence for the radiative impact of aerosols in modifying sea surface temperature over the Indian Ocean, National Space Science Symposium (NSSS-08), Ooty, February 2008.
8. **Sandhya.K.Nair**, Short-wave radiative forcing due to sea-salt aerosols over the oceanic region around the Indian subcontinent, *Indo-Russian workshop on regional climate change*, 8-9 October 2009, Cochin.

9. **Sandhya K. Nair**, S. Sijikumar ,Impact of Continental meteorology and atmospheric circulation in the modulation of Aerosol Optical Depth over the Arabian Sea, METOC, Cochin, November 1-2, 2010.
10. Rajeev K, K.Parameswaran, **Sandhya K.Nair** and S.Meenu, Observational evidence for the radiative impact of aerosols in modifying sea surface temperature over the Indian Ocean, National Space Science Symposium (NSSS-08), Ootty, February 2008.
11. K Rajeev, **Sandhya K Nair** and K Parameswaran, Radiative forcing due to aerosols over the Arabian Sea, Bay of Bengal and Indian Ocean, National Space Science symposium, Andhra University, Visakhapatnam, 9-12 February 2006.
12. K Parameswaran, K Rajeev and **Sandhya K Nair**, Seasonal changes in the latitude gradient of aerosol optical depth over the oceanic regions near the Indian continent: Contribution from continental aerosols, National Space Science Symposium, Andhra University, Visakhapatnam, 9-12 February 2006.
13. K Parameswaran, **Sandhya K Nair** and K Rajeev, Spatial distribution of Sea-Salt and Non-Sea-Salt aerosols on the oceanic environment from space borne measurements, National Conference on Atmosphere Ocean Interaction and Monsoon Variability (ATMOCIN-2006), Cochin University of Science and Technology, 11-13 January, Kochi, 2006.
14. K, Rajeev, **Sandhya K Nair** and K Parameswaran, Radiative impact of aerosols over the Arabian Sea, Bay of Bengal and Indian ocean during the Asian Summer monsoon and Asian Dry seasons, Asian Aerosol Conference (AAC-2005), Mumbai, 13-16 December, 2005.
15. **Sandhya K Nair**, K Rajeev and K Parameswaran, Pathways of aerosol transport over the Arabian Sea, Bay of Bengal and Indian Ocean during the Asian Dry and summer monsoon seasons, IV Asian Aerosol conference, Mumbai, 13-16 December 2005.
16. K Rajeev, K Parameswaran and **Sandhya K Nair**: Impact of Southeast Asian forest fires on the aerosol loading over the tropical Indian ocean during the El nino events, National Space Science Symposium, Kottayam, February, 2004.
17. **Sandhya K. Nair**, K. Rajeev and K. Parameswaran: Satellite observations of aerosol distribution and transport over the oceanic areas around the Indian subcontinent: mean structure and variabilities, National Space Science Symposium, Kottayam, February 2004.
18. K. Parameswaran, **Sandhya K. Nair** and K. Rajeev: Space borne observations of the effect of Indonesian forest fires on the aerosol loading over Indian Ocean, IASTA, Trivandrum, September 2002.
19. K. Rajeev, **Sandhya K. Nair**, and K. Parameswaran: Influence of synoptic circulation on aerosol loading over the Indian Ocean IASTA, Trivandrum, September 2002.
20. K. Parameswaran, K. Rajeev and **Sandhya K. Nair**: Impact of El Nino related forest fires on aerosol loading over the Indian Ocean, National Space Science Symposium, Bhopal, February, 2002.
21. **Sandhya K. Nair**, K. Rajeev and K. Parameswaran: Winter time regional aerosol distribution and the influence of continental transport over the Indian, National Space science Symposium, Bhopal, February, 2002.
22. K. Rajeev, **Sandhya K. Nair** and K.Parameswaran: Cloud Screening in IRS-P4 OCM data using spatial coherence method, National Space science Symposium, Bhopal ,February, 2002.
23. **Sandhya K. Nair**, K Rajeev, and K. Parameswaran: Satellite borne observations of the atmospheric particulate matter over the ocean: SPIE International Conference and XXV11 Annual Convention, Thiruvananthapuram, July 2001.

24. **Sandhya K. Nair**, K. Rajeev and K. Parameswaran: Regional aerosol distribution and transport over the Bay of Bengal during the winter months of 1996- 1999, Tropmet, Bombay, February, 2001.
25. **Sandhya K Nair** and P V. Joseph: Relationship between Indian summer monsoon rainfall and northwest Pacific cyclones during the period June to September, Tropmet, Cochin, February, 2000.

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