

Girach Imran Asatar



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Research Area

Atmospheric Science: Research on atmospheric trace gases like Carbon monoxide (CO), Ozone (O₃), Oxides of nitrogen (NO_x), Methane (CH₄), Carbon dioxide (CO₂), etc. based on in-situ measurements, satellite observations and modeling.

Though the concentration these gases are very low (<1%) in the atmosphere, they play major role in climate, atmospheric chemistry, air quality, etc. Due to their short lifetime in the atmosphere and diverse emission sources, they exhibit large spatio-temporal variations. In order to understand their concentration levels, variabilities and role of atmospheric processes; in-situ measurements are carried out using state-of-the-art instruments at trace gas observatory at SPL. In addition to this ground-based observations, thematic field experiments over remote regions (oceanic region adjoining India) are conducted for regional characteristics of these gases. While in situ observations are utilized for satellite validations, satellite observations are used to complement the information on these gases in the upper atmosphere. Combining in-situ measurements with satellite observations and modeling, various atmospheric processes (dynamical as well as chemical) influencing trace gas concentration are unraveled.

Academic Qualification

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| • Ph.D. | 2019 | Physics, Thesis Title: "Investigations on the distribution of tropospheric carbon monoxide over India and surrounding oceanic region", Cochin University of Science & Technology, Cochin, India. Thesis advisor: Dr. Prabha R Nair.
Thesis: http://dyuthi.cusat.ac.in/purl/5543 |
| • M. Sc. | 2007 | Physics (Material Science), First class with Distinction (82.5%), Saurashtra University, Rajkot, India. |
| • B. Sc. | 2005 | Physics, First class (77.1%), Saurashtra University, Rajkot, India. |

Professional Background

• Scientist-SE	Jul 2017–Present	Space Physics Laboratory, VSSC, ISRO, India
• Scientist-SD	Jul 2012–Jul 2017	Space Physics Laboratory, VSSC, ISRO, India
• Scientist-SC	Feb 2008–Jul 2012	Space Physics Laboratory, VSSC, ISRO, India
• Research Scholar	Sep 2007– Feb 2008	Institute for Plasma Research, Gandhinagar, India

Awards & Honors

- **"Honorable Mention"** for the poster presentation on **"Surface ozone over the coastal Antarctica during Austral summer"** authored by Imran A. Girach, Prabha R. Nair, Andrea Pozzer, Narendra Ojha, K. V. Subrahmanyam, Koushik N., Mohammed Nazeer M., and Kiran Kumar N. V. P. in the **"14th iCACGP (The international Commission on Atmospheric Chemistry and Global Pollution) Quadrennial Symposium/15th IGAC (International Global Atmospheric Chemistry) Science Conference"** at Takamatsu, Kagawa, Japan during 25–29 September 2018.
- **Best paper award** for the paper titled **"Global long-term trend in tropospheric carbon monoxide"** authored by Girach I. A. and Prabha R. Nair in **"International Conference on Climate Change and Disaster Management"** at Kovalam, Thiruvananthapuram, India during 26–28 February-2015.
- **Third prize** in the assessment of "SERC" school on "Atmospheric Chemistry and Air Pollution" at National Physical Laboratory during 2–22 March-2010.
- First Prize in Poster Presentation about LASER at PHYSICS CLUB, Saurashtra University, Rajkot in February 2007.
- First Prize in Multiple Choice Question Competition at PHYSICS CLUB, Saurashtra University, Rajkot in February 2007.

Awards to contributory papers:

- **Young Scientist Award** for Best paper "Distribution of sulfur dioxide over Indian subcontinent: Remote sensing observations and model reanalysis" authored by Lakhima C., N. Ojha, **I. A. Girach**, B. Pathak, L. K. Sahu, and P. K. Bhuyan, at General Assembly and Scientific Symposium (GASS) of the International Union of Radio Science (Union Radio Scientifique Internationale-URSI), Rome, Italy, 2020.
- **Young Scientist Award** for Best Paper entitled "Upper tropospheric ozone transport from the sub-tropics to tropics over the Indian region during Asian summer monsoon", *Climate Dynamics*, 52, 7–8, 4567–4581, 2019 authored by Das S. S., K. V. Suneeth, M. Venkat Ratnam, **I. A. Girach**, S. K. Das.

Scientific Recognition

- **"Certificate of Reviewer Excellence"** for two consecutive years, **2018 and 2019** in recognition of outstanding contributions as a reviewer for the **"Journal of Earth System Science", Indian Academy of Sciences.**
- **Lead Talk** on "Trace gases in the marine boundary layer of the Arabian Sea and Indian Ocean during winter", authored by **Girach I. A.**, Tripathi N., Ojha N., P. R. Nair, L. K. Sahu; at 20th National Space Science Symposium, 29–31 January **2019**, Savitribai Phule Pune University (SPPU), Pune.
- Member of ISRO delegate to COSPAR 2012, Mysore, India.

Participation in Scientific Expedition

- **Expedition to south eastern Arabian Sea and Equatorial Indian Ocean:** ICARB-2018 (Integrated Campaign for Aerosols, gases and Radiation Budget-2018) during 16 January to 14 February 2018. Conducted experiment on board Sagar Kanya (SK-345).
- **Expedition to Antarctica:** 35th ISEA (Indian Scientific Expedition to Antarctica) during 4 January to 4 March 2016. Conducted various experiments at Bharati station.
- **Expedition to the Bay of Bengal – Monsoon Season:** CTCZ (Continental Tropical Convergence Zone) experiment conducted during 16 July to 17 August 2009. Conducted experiment on board Sagar Kanya (SK-261).
- **Expedition to the Bay of Bengal – Winter Season:** W_ICARB (Winter_Integrated Campaign for Aerosols, gases and Radiation Budget) campaign during 27 December to 30 January 2009. Conducted experiment on board Sagar Kanya (SK-254).

Membership in Professional Bodies

- PSSI (Plasma Science Society of India) – LM-747
- ISCA (Indian Science Congress Association)

Present Responsibilities

- Research & Development in the area of atmospheric trace gases
- Principal Investigator for Atmospheric Trace gases-Chemistry, Transport and Modelling (AT-CTM) project at SPL under Geosphere Biosphere Programme of ISRO (ISRO-GBP) [since May-2019].
- Member, SPL Website Committee: April 2018 – Present (Member, SPL Website Development Team: May 2014 – April 2018)

Invited Talk

- "Climate Change" at International Webinar on Advances in Nonlinear Optics and Space Science, Providence Women's College, Kozhikode, Kerala on 19 September 2020.

- “Climate Change” at Graphic Era Deemed to be University, Dehradun on 19 September 2019.
- “Trace gases in remote area: Observations and modeling” at Swami Rama Himalayan University, Dehradun on 10 April 2018.
- “Trace gases over the Bay of Bengal during monsoon season” at Physical Research Laboratory, Ahmedabad on 18 September 2017.

Publications (Peer-Reviewed International Journals) - 29

[Citation=299, h-index=11, i10-index=11]

<https://scholar.google.co.in/citations?user=Erj94zMAAAAJ&hl=en>

1. **Girach I. A.**, Tripathi N., Nair P. R., Sahu L. K., Ojha N., “O₃ and CO in the South Asian outflow over the Bay of Bengal: Impact of monsoonal dynamics and chemistry”, 233, 117610, 2020. (<https://doi.org/10.1016/j.atmosenv.2020.117610>)
2. **Girach I. A.**, Nair P. R., Ojha N., Sahu L. K., "Tropospheric carbon monoxide over the northern Indian Ocean during winter: influence of inter-continental transport", *Climate Dynamics*, 2020. (<http://dx.doi.org/10.1007/s00382-020-05269-4>)
3. Ojha N, Sharma A, Kumar M, **Girach I.**, Ansari T. U., Sharma S. K., Singh N., Pozzer A. and Gunthe S. S., "On the widespread enhancement in fine particulate matter across the Indo-Gangetic Plain towards winter", *Scientific Reports*, 10:5862, 2020. (<http://dx.doi.org/10.1038/s41598-020-62710-8>)
4. Boreddy S. K. R., Hegde P., Aswini A. R., **Girach I. A.**, Koushik N., Nalini K., “Impact of ice-free oases on particulate matter over the East Antarctic: Inferences from the carbonaceous, water-soluble species and trace metals”, *Polar Science*, 24, 100520, 2020. (<https://doi.org/10.1016/j.polar.2020.100520>)
5. Aswini A. R., Hegde P., Aryasree S., **Girach I. A.**, Nair P. R., “Continental outflow of anthropogenic aerosols over Arabian Sea and Indian Ocean during wintertime: ICARB-2018 campaign”, *Science of the Total Environment*, 712, 135214, 2020. (<https://doi.org/10.1016/j.scitotenv.2019.135214>)
6. Ajayakumar R. S., Nair P. R., **Girach I. A.**, Sunilkumar S.V., Muhsin M., Satheesh Chandran P.R., "Dynamical nature of tropospheric ozone over a tropical location in Peninsular India: Role of transport and water vapour" *Atmospheric Environment*, 218, 117018, 2019. (<https://doi.org/10.1016/j.atmosenv.2019.117018>)
7. Chutia L., Ojha N., **Girach I. A.**, Sahu L. K., Alvarado L. M. A., Burrows J. P., Pathak B., and Bhuyan P. K., "Distribution of volatile organic compounds over Indian subcontinent during winter: WRF-chem simulation versus observations", *Environmental Pollution*, 252, 256–269, 2019. (<http://dx.doi.org/10.1016/j.envpol.2019.05.097>)
8. Ojha N., **Girach I.**, Sharma K., Nair P., Singh J., Sharma N., Singh N., Flemming J., Inness A., Subrahmanyam K. V., "Surface ozone in the Doon Valley of the Himalayan foothills during spring", *Environmental Science and Pollution Research*, 26(19), 19155–19170, 2019. (<https://doi.org/10.1007/s11356-019-05085-2>)
9. Koushik N., K. K. Kumar, K. V. Subrahmanyam, G. Ramkumar, **I. A. Girach**, M. Santosh, K. Nalini, M. Nazeer, P. R. Shreedevi, "Characterization of inertia gravity waves and associated dynamics in the lower stratosphere over the Indian Antarctic station, Bharati (69.4 S, 76.2 E)

- during austral summers", *Climate Dynamics*, 53,5–6, 2887–2903, 2019. (<http://dx.doi.org/10.1007/s00382-019-04665-9>)
10. Das S. S., K. V. Suneeth, M. Venkat Ratnam, **Girach I. A.**, Subrata Kumar Das, "Upper tropospheric ozone transport from the sub-tropics to tropics over the Indian region during Asian summer monsoon", *Climate Dynamics*, 52, 7–8, 4567–4581, 2019. (<https://doi.org/10.1007/s00382-018-4418-6>)
 11. Gogoi M. M., Babu S. S., Pandey S. K., Nair V. S., Vaishya A., **Girach I. A.** and Koushik N., "Scavenging Ratio of Black Carbon in the Arctic and the Antarctic", *Polar Science*, 16,10–22, 2018. (<https://doi.org/10.1016/j.polar.2018.03.002>)
 12. Kavitha M., Nair P. R., **Girach I. A.**, Aneesh S., Sijikumar S., and Renju R., "Diurnal and seasonal variations in surface methane at a tropical coastal station: Role of mesoscale meteorology", *Science of the Total Environment*, 631–632, 1472–1485, 2018. (<https://doi.org/10.1016/j.scitotenv.2018.03.123>)
 13. Nair P. R., Revathy S. A., David L. M., **Girach, I. A.**, and Kavitha M., "Decadal changes in surface ozone at the tropical station Thiruvananthapuram (8.542° N, 76.858° E), India: effects of anthropogenic activities and meteorological variability", *Environmental Science and Pollution Research*, 25, 15, 14827–14843, 2018. (<https://doi.org/10.1007/s11356-018-1695-x>)
 14. **Girach I. A.**, N. Ojha, Prabha R. Nair, Y. K. Tiwari, and K. Ravi Kumar, "Variations of trace gases over the Bay of Bengal during the summer monsoon", *Journal of Earth System Science*, 127, 15, 2018. (<http://dx.doi.org/10.1007/s12040-017-0915-y>)
 15. Phanikumar D.V., Niranjana Kumar K., Bhattacharjee S., Naja M., **Girach I. A.**, Nair P. R., and Kumari S., "Unusual enhancement in tropospheric and surface ozone due to orography induced gravity waves", *Remote Sensing of Environment*, 199, 256–264, 2017. (<http://dx.doi.org/10.1016/j.rse.2017.07.011>)
 16. **Girach I. A.**, N. Ojha, Prabha R. Nair, A. Pozzer, Y. K. Tiwari, K. Ravi Kumar and J. Lelieveld, "Variations in O₃, CO, and CH₄ over the Bay of Bengal during the summer monsoon season: shipborne measurements and model simulations", *Atmos. Chem. Phys.*, 17, 257-275, 2017. (<http://dx.doi.org/10.5194/acp-17-257-2017>)
 17. **Girach I. A.** and Prabha R. Nair, "Long-term trend in tropospheric carbon monoxide over the globe", *Proc. SPIE 9876, Remote Sensing of the Atmosphere, Clouds, and Precipitation VI*, 987624, 2016. (<http://dx.doi.org/10.1117/12.2223380>)
 18. Das S. S., M. V. Ratnam, K. N. Uma, A. K. Patra, K. V. Subrahmanyam, **I. A. Girach**, K.V. Suneeth, K. K. Kumar, and G. Ramkumar, "Stratospheric intrusion into the troposphere during the tropical cyclone Nilam (2012)", *Quarterly Journal of Royal Meteorological Society*, 142, 698, 2168–2179, 2016. (<http://dx.doi.org/10.1002/qj.2810>)
 19. Das S. S., M. V. Ratnam, K. N. Uma, K. V. Subrahmanyam, **I. A. Girach**, A. K. Patra, S. Aneesh, K. V. Suneeth, K. K. Kumar, A. P. Kesarkar, S. Sijikumar and G. Ramkumar, "Influence of tropical cyclones on tropospheric ozone: possible implication", *Atmospheric Chemistry and Physics*, 16, 4837–4847, 2016. (<http://dx.doi.org/10.5194/acp-16-4837-2016>)
 20. Hegde P., K. Kawamura, **I. A. Girach** and P. R. Nair, "Characterisation of water-soluble organic aerosols at a site on the southwest coast of India", *Journal of Atmospheric Chemistry*, 73, 2, 181–205, 2016. (<http://dx.doi.org/10.1007/s10874-015-9322-4>)
 21. Aryasree S., P. R. Nair, **I. A. Girach** and S. Jacob, "In situ measured seasonal characteristics of near-surface aerosols over Bay of Bengal and MODIS-retrieved columnar properties: A

- multicampaign analysis", *Journal Geophysical Research*, 120, 10548–10568, 2015. (<http://dx.doi.org/10.1002/2015JD023418>)
22. Aryasree S., P. R. Nair, **I. A. Girach** and S. Jacob, "Winter time chemical characteristics of aerosols over the Bay of Bengal: continental influence", *Environmental Science and Pollution Research*, 22, 19, 14901-14918, 2015. (<http://dx.doi.org/10.1007/s11356-015-4700-7>)
 23. **Girach, I. A.**, P. R. Nair (2014), "Carbon monoxide over Indian region as observed by MOPITT", *Atmos. Environ.*, 99, 599-609. (<http://dx.doi.org/10.1016/j.atmosenv.2014.10.019>)
 24. **Girach, I. A.**, V. S. Nair, S. S. Babu, P. R. Nair (2014), "Black Carbon and Carbon Monoxide over Bay of Bengal during W_ICARB: Source characteristics", *Atmos. Environ.*, 94, 508-517. (<http://dx.doi.org/10.1016/j.atmosenv.2014.05.054>)
 25. **Girach, I. A.**, P. R. Nair (2014), "On the vertical distribution of Carbon monoxide over Bay of Bengal during winter: Role of water vapour and vertical updrafts", *J. Atmos. Sol. Terr. Phys.*, 117, 31–47. (<http://dx.doi.org/10.1016/j.jastp.2014.05.003>)
 26. **Girach, I. A.**, P. R. Nair, L. M. David, P. Hegde, M. K. Mishra, G. M. Kumar, S. M. Das, N. Ojha, and M. Naja (2012), "The changes in near-surface ozone and precursors at two nearby tropical sites during annular solar eclipse of 15 January 2010", *J. Geophys. Res.*, 117, D01303. (<http://dx.doi.org/10.1029/2011JD016521>)
 27. David, L. M., **Girach, I. A.** and Nair, P. R. (2011), "Distribution of ozone and its precursors over Bay of Bengal during winter 2009: Role of meteorology", *Ann. Geophys.*, 29, 1613–1627. (<http://dx.doi.org/10.5194/angeo-29-1613-2011>)
 28. Nair P. R., David, L. M., **Girach, I. A.**, George, K. S. (2011), "Ozone in the marine boundary layer of Bay of Bengal during post-winter period: Spatial pattern and role of meteorology", *Atmos. Environ.*, 45, 4671-4681. (<http://dx.doi.org/10.1016/j.atmosenv.2011.05.040>)
 29. **Girach I. A.** and Nair, P. R. (2010), "Spatial distribution of near-surface CO over bay of Bengal during winter: role of transport", *J. Atmos. Sol. Terr. Phys.*, 72, 1241–1250. (<http://dx.doi.org/10.1016/j.jastp.2010.07.025>)

Participation in International School

1. **Early Career Short Course** organised by iCACGP (The international Commission on Atmospheric Chemistry and Global Pollution) and IGAC (International Global Atmospheric Chemistry) project at Shodoshima Island, Takamatsu, Japan during September 22-24, 2018.
2. **Girach I. A.**, "European Research Course on Atmosphere (ERCA) - 2015" conducted by Université Joseph-Fourier (UJF) and Centre National de la Recherche Scientifique (CNRS) during 7th January to 6th February 2015 at Grenoble, France.

Participation in International Conference

1. Soni M., **Girach I.**, Ojha N., Chemistry and dynamics of reactive trace gases over India, Aerosol Air Quality, Climate Change and Impact on Water Resources and Livelihoods in the

Greater Himalayas, 14-16 September 2020, ARIES, Nainital, India.

2. Sharma K., **Girach I.**, Sharma N., Singh N., Ojha N., Ozone variations in a central Himalayan valley: Seasonal changes and impact of biomass-burning, Aerosol Air Quality, Climate Change and Impact on Water Resources and Livelihoods in the Greater Himalayas, 14-16 September 2020, ARIES, Nainital, India.
3. Chutia L., Ojha N., **Girach I. A.**, Pathak B., Sahu L. K., and Bhuyan P. K., Distribution of sulfur dioxide over Indian subcontinent: Remote sensing observations and model reanalysis, General Assembly and Scientific Symposium (GASS) of the International Union of Radio Science (Union Radio Scientifique Internationale-URSI), Rome, Italy, 2020.
4. Chutia L., Ojha N., **Girach I. A.**, Pathak B., and Bhuyan P. K., Regional scale modeling of secondary organic aerosols over Indian subcontinent using WRF-chem during winter, 4th ACAM Workshop, 26–28 June, 2019, UKM, Malaysia.
5. Ojha N., **Girach I. A.**, Saha S., Sharma S. K., Singh N., Tropospheric Ozone over South Asia: Climatology and Long-term Trend, URSI AP-RASC 2019, 09–15 March 2019, JNU, New Delhi, India.
6. Sharma K., Ojha N., **Girach I. A.**, Sharma N., Nair P. R., Singh N., Ozone Pollution in the Doon valley of Central Himalaya: Observations and model results, International Conference on Atmospheric Chemistry and Physics in Highly Polluted Environments, 22–24 March 2019, Delhi, India.
7. **Girach I. A.**, Prabha R. Nair, Andrea Pozzer, Narendra Ojha, K. V. Subrahmanyam, Koushik N., Mohammed Nazeer M., and Kiran Kumar N. V. P., “Surface ozone over the coastal Antarctica during Austral summer” in the "14th iCACGP (The international Commission on Atmospheric Chemistry and Global Pollution) Quadrennial Symposium/15th IGAC (International Global Atmospheric Chemistry) Science Conference" at Takamatsu, Kagawa, Japan during 25–29 September 2018.
8. Phanikumar D. V., K. Niranjana Kumar, S. Bhattacharjee, M. Naja, and **I. A. Girach**, “Enhancement of Tropospheric and Surface Ozone Observed During Orography Induced Gravity Waves Over Himalayan Region”, AS41-D4-PM2-334-007, AS41-A014, 14th Annual Meeting of the Asia Oceania Geosciences Society (AOGS - 2017), 6–11 August, 2017, Singapore.
9. **Girach I. A.** and Prabha R Nair, "Seasonal variations of surface Ozone and Carbon monoxide over the Bay of Bengal: Synthesis of multi-campaign measurements", Predicting and Projecting Climate change over Asian Region (UPCAR) conference during 26–28 June 2017 at Sri Venkateswara University, Tirupati and National Atmospheric Research Laboratory (NARL), Gadanki, India.
10. **Girach I. A.** and Prabha R. Nair, "Long-term trend in tropospheric carbon monoxide over the globe", SPIE Asia-Pacific Remote Sensing conference during 4–7 April 2016 at Vivanta by Taj-Dwarka, New Delhi, India.
11. Best paper award: **Girach I. A.** and Prabha R. Nair, "Global long-term trend in tropospheric carbon monoxide", International Conference on Climate Change and Disaster Management, during 26–28 February 2015 at Thiruvananthapuram, India.
12. Participated in the international school on "Data Assimilation" during 16–20 December, 2013 conducted by Indian Institute of Remote Sensing (IIRS), Department of Meteorology, University of Reading, United Kingdom and the UK space agency at IIRS, Dehradun, India.
13. Participated in AdMet-2013 Conference on “Advances in Metrology” held during 21-23rd

February 2013 at CSIR-National Physical laboratory (NPL), New Delhi, India.

14. Participated in pre-AdMet-2013 workshop on “Chemical Metrology: Challenges and Opportunities in Gases & Aerosols” on 20th February 2013 at CSIR-National Physical laboratory (NPL), New Delhi, India.
15. Nair P. R., David L. M., Aryasree S., **Girach I. A.**, and Sijikumar S., “Role of Mesoscale dynamics in modifying the diurnal variation of trace gases and aerosols at a coastal environment”, A1.1-0117-12 during 14–22 July 2012, 39th Committee on Space Research (COSPAR) - 2012, Mysore, India.
16. **Girach I. A.** and Prabha R. Nair, “Distribution of Carbon monoxide over Indian region as observed by Measurements of Pollution in the Troposphere (MOPITT)”, A1.1-0026-12, during 14–22 July 2012, 39th Committee on Space Research (COSPAR) - 2012, Mysore, India.
17. Liji Mary David, Prabha R Nair and **Girach I. A.**, “Association of synoptic circulation on the seasonal variability of near-surface ozone and NO_x at a tropical coastal site” during 5–9 July 2010, AOGS Conference, Hyderabad, India.
18. **Girach I. A.**, Prabha R Nair and Liji Mary David, “Spatial Variation of Ozone, Carbon Monoxide and Nitrogen Dioxide over Bay of Bengal during Winter” during 5–9 July 2010, AOGS Conference, Hyderabad, India.
19. **Girach I. A.**, Prabha R Nair, S Sijikumar and Aryasree, “Trace gases at coastal station and over marine environment: Close association with meteorology” during 14–24 March 2010, Indo-US Conference-cum-Workshop on Air Quality and Climate Research, Hyderabad, India.

Participation in National Conference/Symposium/Workshop

1. **Girach I. A.**, Ojha N., and Nair P. R., Validation of Satellite retrieved Tropospheric CO and CH₄, URSI (International Radio Science Union) Regional Conference on Radio Science (URSI-RCRS) -2020, Varanasi, 12 - 14 February 2020.
2. Ojha N., **Girach I. A.**, and Sahu L. K., Tropospheric Chemistry over the Indian Subcontinent: Space-based Observations and Modeling, URSI (International Radio Science Union) Regional Conference on Radio Science (URSI-RCRS) -2020, Varanasi, 12 - 14 February 2020.
3. **Chutia L.**, Ojha N., Girach I. A., Pathak B., Sahu L. K., and Bhuyan P. K., Long term changes in sulfur dioxide (SO₂) over South Asia during 2005-2017 period, URSI (International Radio Science Union) Regional Conference on Radio Science (URSI-RCRS) -2020, Varanasi, 12 - 14 February 2020. (3rd Prize in student paper competition)
4. Ojha N., **Girach I.**, Soni M., Singh N., Gunthe S. S., Modelling the atmospheric chemistry and dynamics over India, National conference on Recent Trends in Environmental Pollution and Disaster Risk Reduction (RTEPDRR-2020), FICCI, New Delhi, 6–7 February 2020. (Invited Talk)
5. Chutia, L., Ojha, N., Girach, I., Sahu, L. K., Sarangi, C., Pathak, B., Bhuyan, P. K., Distribution of Trace Gases over South Asia: Model Simulation versus Observations, 4th ISSE National conference (INAC-4), Space Applications Centre, Ahmedabad, 26-27 September, 2019.
6. Chutia L., Ojha N., **Girach I.** and Pathak B., "Distribution of volatile organic compounds over Indian subcontinent during winter: WRF-chem simulations versus observations", Indian Aerosol Science and Technology Association (IASTA-2018), organised by Centre for Atmospheric Sciences, IIT Delhi during 26–28 November, 2018.
7. **Lead Talk: Girach I. A.**, Tripathi N., Ojha N., P. R. Nair, L. K. Sahu, Trace gases in the marine

- boundary layer of the Arabian Sea and Indian Ocean during winter, 20th National Space Science Symposium, Savitribai Phule Pune University (SPPU), Pune, 29–31 January 2019.
8. Ojha N., **Girach I. A.**, Saha S., Sharma S. K., Singh N., Spatio-temporal distribution of tropospheric ozone over South Asia: Model results versus Observations, 20th National Space Science Symposium, Savitribai Phule Pune University (SPPU), Pune, 29–31 January 2019.
 9. Chutia L., Ojha N., Kumar M., Kumar A., **Girach I. A.**, Pathak B., Bhuyan P. K., Regional scale modeling of secondary organic aerosols over Indian subcontinent using WRF-chem during winter, 20th National Space Science Symposium, Savitribai Phule Pune University (SPPU), Pune, 29–31 January 2019.
 10. Kavitha, M., Nair, P. R., **Girach I. A.**, and Renju, R., “Diurnal and seasonal variation of trace gases over the tropical coastal station, Thumba, Thiruvananthapuram, 13th Kerala Environmental Congress, Thiruvananthapuram, 6–8 December, 2017.
 11. **Girach I. A.**, Prabha R. Nair, K. V. Subrahmanyam, Koushik N., Shreedevi P. R., Mohammed Nazeer M., and Kiran Kumar N. V. P., “Surface ozone variation during summer season at Bharati station, Antarctica”, NCPS – 2017 National Conference on Polar Sciences, 16–17 May 2017, National Centre for Antarctic and Ocean Research (NCAOR), Ministry of Earth Sciences (MoES), Goa.
 12. Nair P. R., **Girach I. A.**, Kavitha M., Revathy S. A., and Aryasree S., Systematic seasonal pattern of tropospheric trace species over Indian region, TROPMET 2016 – National Symposium on Tropical Meteorology: Climate Change and Coastal Vulnerability, 18–21 December 2016, SOA University, Bhubneswar.
 13. **Girach I. A.**, N. Ojha, P. R. Nair, Y. K. Tiwari, K. Ravi Kumar, Variations of trace gases over the Bay of Bengal during the summer monsoon, TROPMET 2016 – National Symposium on Tropical Meteorology : Climate Change and Coastal Vulnerability, 18-21 December 2016, SOA university, Bhubneswar.
 14. **गिराच इमरान और प्रभा आर नायर**, तटीय स्टेशन थुम्बा पर विभिन्न परिवेशी अनुरेख गैसों का विचरण, केंद्र स्तरीय तकनीकी हिन्दी संगोष्ठी, 19-20 जुलाई 2016, विक्रम साराभाई अंतरिक्ष केंद्र, तिरुवनन्तपुरम-695022.
 15. **Girach I. A.**, Prabha R. Nair and Prashant Hegde, Carbon monoxide over Indian region as observed by MOPITT, PS1A_237, National Space Science Symposium, 9-12 February 2016, Space Physics Laboratory, Vikram Sarabhai Space Centre, ISRO, Trivandrum-695022.
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