Dr. Manju G.
Scientist/Engineer:'SF'
SPL, VSSC, ISRO
Trivandrum: 695022
Email: manju_spl@vssc.gov.in

Research interests

- Investigations on Equatorial Spread F /Scintillations and their day to day variability to facilitate prediction of navigation and communication outages.
- In-situ probing of terrestrial and planetary ionospheres
- Investigations on terrestrial and planetary upper atmospheric response to diverse geophysical conditions

Academic Qualifications

1. Doctor of Philosophy (Ph.D.), University of Kerala, 1998
2. Master of Science-Physics, University of Kerala, 1991
2. Bachelor of Science-Physics, University of Kerala, 1989

Fellowships, Honors and Awards

1. Guest Editor of Sun and Geopshere Journal : 2018
2. AGU Editor's Choice for paper (Manju et al., JGR, 2011)
3. Best paper award at National Space Science Symposium-2019 for co-authored paper
4. Honorary mention for co-author paper presented at URSI RCRS-2014 conference in Pune
5. ISRO team excellence award-2011 for Sooryagrahan Campaign
6. ISRO Visiting Fellowship (1992-1997)
7. University Merit Scholarship (1985-1991)

Professional Experience

Space Physics Laboratory
Scientist/Engineer at SPL, VSSC: 2003-till date
ISRO Visiting Fellow, SPL, VSSC (1992-1997)

RRSSSC, Kharagpur
Scientist/Engineer at RRSSC, ISRO, Kharagpur (2002-2003)
Scientific Assistant, RRSSC, ISRO, Kharagpur (1999-2002)

Professional responsibilities

IDEA Payload on PS4	:	**Principal Investigator**
RAMBHA-LP on Chandrayaan -3	:	**Principal Investigator**
SOUREX Experiment	:	**Co-Principal Investigator**
INSWIM	:	**Project Manager**

Journal Publications: 44
Conference presentation: 35
Invited talks :3
Research Supervision, Ph.D. : 3 ; 2 Ph. D. s awarded; 1 Ongoing

Publications in peer reviewed journals/proceedings

1. **Manju G.** and N. Mridula, First estimations of gravity wave potential energy in the Martian thermosphere: An analyisi using MAVEN NGIMS data, Monthy notices of the Royal Astronomical Society, (Accepted article), 2020.
2. Aswathy, R. P. and **G. Manju**, The post sunset equatorial F- region zonal drift variability and its linkage with equatorial spread F onset and duration over Indian longitudes, Advances in Space Research, (Accepted article), 2020.
3. **Manju G** and Aswathy R. P., Ionospheric Planetary Wave Activity and Its Role in equatorial Spread F Day-to-Day Variability, J. Geophys, Res., 10.1029/2020JA027960, 2020.
4. Mridula, N. and **G. Manju**, On the seasonal pattern of the diurnal evolution of the longitudinal structures in MAVE NGIMS derived CO2 densities over martian upper atmosphere, Journal of Atmospheric and Solar–Terrestrial Physics, 105508, 2020.
5. Mridula N., Tarun Kumar Pant, **G. Manju**, On the variability of the Equatorial Ionization Anomaly Trough over Indian region: A novel analysis using Beacon TEC measurements, Advances in Space Research, /doi.org/10.1016/j.asr.2020.04.040, 2020.
6. **Manju, G.,** Tarun K. Pant, P. Sreelatha, Santhosh J. Nalluveettil, P. Pradeep Kumar, Nirbhay Kumar Upadhyay, Md. Mosarraf Hossain, Neha Naik, Vipin Kumar Yadav, Rosmy John, R. Sajeev, Jothi Ramalingam, Philip George, Amarnath Nandi, N. Mridula, Aswathy R. P. Janmejay Jaiswal Rana, Snehil Srivastava and Satheesh Thampi, New outlook on lunar near surface plasma environment from Chandrayaan-2 lunar lander platform: RAMBHA_LP payload perspective, Current Science, 118(3), 383, 2020
7. Aswathy R.P., **G. Manju,** Time of evening zonal drift reversal in F- region and its implications for post sunset ionosphere, Journal of Atmospheric and Solar–Terrestrial Physics 200, 105210, https://doi.org/10.1016/j.jastp.2020.105210, 2020.
8. **Manju, G**., Tarun K. Pant, N. Mridula, R.P. Aswathy, P. Sreelatha, Rosmy John, R. Satheesh Thampi, A.N. Aneesh, J.K. Abhishek, 2020, In-situ observations of rocket burn induced modulations of the top side ionosphere using the IDEA payload on-board the unique orbiting experimental platform (PS4) of the Indian Polar orbiting Satellite Launch Vehicle mission, Journal of Atmospheric and Solar–Terrestrial Physics, 199, 105203, https://doi.org/10.1016/j.jastp.2020.105203, 2019.
9. N. Mridula, Tarun Kumar Pant, **G. Manju**, K.V. Subrahmanyam, K. Kishore Kumar, On the role of F3 layers as well as solar flux in modulating the topside ionization over Indian region: An analysis, Journal of Atmospheric and Solar-Terrestrial Physics, 189, 52-64, 2019.
10. **Manju G** and Aswathy R P., 'First time estimation of thermospheric neutral densities from threshold curves of ESF triggering: A novel evidence for ionosphere-thermosphere coupling', Journal of Geophysical Research: Space Physics, 123, doi:10.1029/2018JA025967, 2018

11. Aswathy, R. P., **Manju, G.,** & Sunda, S., The response time of equatorial ionization anomaly crest: A unique precursor to the time of equatorial spread F initiation. Journal of Geophysical Research: Space Physics, 123 , doi.org/10.1029/2018JA025469, 2018
12. Aswathy R. P. and **G. Manju,** Hind-casting of Equatorial Spread F (ESF) using seasonal empirical models Journal of Geophysical Research: Space Physics, 123, 1515–1524, doi.org/10.1002/2017JA025036, 2018.
13. Madhav Haridas M. K., **G. Manju** and T. Aruznamani, Solar activity variations of Equatorial Spread F occurrence and sustenance time during different seasons over Indian longitudes: Empirical model and causative mechanisms, Adv. Space Res., 10.1016/j.asr.2018.02.040, 61(10), 2585-2592, 2018.
14. **Manju G.** and R.P. Aswathy, Climatology of GW-TIDs in the magnetic equatorial upper thermosphere over India,, J. Atmos. Terr. Phys, 164, 142–148, doi.org/10.1016/j.jastp.2017.08.015. 2017.
15. Aswathy R. P. and **G. Manju**, Gravity wave control on ESF day to day variability: an empirical approach, Journal of Geophysical Research (Space Physics), doi:10.1002/ 2017JA023983, 2017.
16. Madhav Haridas, M. K., **G. Manju**, and T. Arunamani, Solar activity variations of nocturnal thermospheric meridional winds over Indian longitude sector, Journal of Atmospheric and Solar Terrestrial Physics, 147, 21–27, doi:10.1016/j.jastp.2016.06.010 ,2016.
17. **Manju G.,** On the unique divergent response of the equatorial electrojet vertical polarization electric field to different solar flare events, Journal of Geophysical Research: Space Physics, 121, doi:10.1002/2015JA021588, 2016.
18. **Manju G.,** Madhav Haridas M. K. and Aswathy R. P., "Role of gravity wave seed perturbations in ESF day-to-day variability: a quantitative approach", Adv. in Space Res., Advances in Space Research 57, 1021–1028, doi:10.1016/j.asr.2015.12.019, 2016.
19. Madhav Haridas, M. K., **G. Manju**, and T. K. Pant , On the solar activity variations of nocturnal F region vertical drifts covering two solar cycles in the Indian longitude sector, Journal of Geophysical Research: Space Physics, doi:10.1002/ 2014JA020561, 2015.
20. **Manju G.** and M. K. Madhav Haridas, On the equinoctial asymmetry in the threshold height for the occurrence of equatorial spread F, Journal of Atmospheric and Solar Terrestrial Physics, 124, 59-62,DOI:10.1016/j.jastp.2015J.01.008), 2015.
21. **Manju G**., Madhav Haridas M. K., G. Ramkumar, Tarun K. Pant, R. Sridharan and Sreelatha P, Gravity wave signatures in the dip equatorial ionosphere–thermosphere system during the annular solar eclipse of 15 January 2010, J Journal of Geophysical Research: Space Physics, (http://dx.doi.org/http://dx.doi.org/10.1002/2014JA019865), 2014.
22. Madhav Haridas, M. K., **G. Manju**, and T. K., First observational evidence of the modulation of the threshold height h'Fc for the occurrence of equatorial spread F by neutral composition changes Journal of Geophysical Research: Space Physics, 118, doi:10.1002/jgra.50331, 2013.
23. Simi. K. G, **G. Manju**, Madhav Haridas, M. K., S. R. Prabhakaran Nayar, Tarun Kumar Pant, S.Alex Ionospheric response to a geomagnetic storm during november 08-10, 2004, Earth Planets Space, 65, 343–350, 2013.
24. **Manju, G**., R. Sridharan, Sudha Ravindran, M.K. Madhav Haridas, T.K. Pant, P. Sreelatha and S.V. Mohan Kumar, "Rocket borne in-situ Electron density and Neutral Wind measurements in the equatorial ionosphere Results from the January 2010 annular solar eclipse campaign from India", Journal of Atmospheric and Solar-Terrestrial Physics, 86, 56-64, 2012.
25. **Manju, G**., R. Sridharan, P. Sreelatha, Sudha Ravindran, M.K. Madhav Haridas, Tarun K. Pant, P. Pradeep Kumar, R. Satheesh Thampi, Neha Naik, N. Mridula, Lijo Jose, S.G. Sumod, A Novel probe for in-situ Electron density and Neutral Wind (ENWi) measurements in the near Earth space, J. Atmos. & Sol. Terr. Phys., 74, 81–86, 2012.
26. Madhav Haridas, M. K., and **G. Manju** , On the response of the ionospheric *F* region over Indian low-latitude station Gadanki to the annular solar eclipse of 15 January 2010, Journal of Geophysical Research: Space Physics, 117, A01302, doi:10.1029/2011JA016695, 2012.
27. **Manju, G.,** M. K. Madhav Haridas., Sudha Ravindran, Tarun Kumar Pant and S. Tulasi Ram, Equinoctial asymmetry in the occurrence of Equatorial Spread F over Indian longitudes during the moderate to low solar activity period 2004-2007, Indian Journal of Radio & Space Physics, Vol 41, pp 240-246, 2012.
28. **Manju G.,** Simi K. G. and S. R. Prabhakaran Nair , Analysis of solar EUV and X- ray flux enhancements during intense solar flare events and the concomitant response of equatorial and low latitude upper atmosphere, J. Atmos. & Sol. Terr. Phys.,86,1-5, 2012.
29. N. Mridula, **G. Manju**, Tarun Kumar Pant, Sudha Ravindran, Lijo Jose, and Shobana Alex, On the significant impact of the moderate geomagnetic disturbance of March 2008 on the equatorial ionization anomaly region over Indian longitudes, Journal of Geophysical Research: Space Physics, 116, A07312, doi:10.1029/2011JA016615, 2011.
30. **Manju G.,** V. Sreeja, S. Ravindran and S. V. Thampi, Towards Prediction of L band scintillations in the Equatorial Ionization Anomaly (EIA) Region, Journal of Geophysical Research: Space Physics, 116, A02307, 8 PP., doi: 10.1029/2010JA015893, 2011.

31. John S. R., Karanam Kishore Kumar, K. V. Subrahmanyam, **G. Manju**, and Q. Wu, Meteor radar measurements of MLT winds near the equatorial electro jet region over Thumba (8.5º N, 77º E): comparison with TIDI observations, Ann. Geophys., 29, 1209– 1214, 2011.

32. Manju G., C. V. Devasia and Sudha Ravindran, The seasonal and solar cycle variations of electron density gradient scale length during magnetically disturbed days: Its implications for Spread F, Earth Planets and Space, 61, 913-917, 2009.

33. Manju G., Tarun Kumar Pant, Sudha Ravindran and R. Sridharan, On the response of the equatorial and low latitude ionospheric regions in the Indian Sector to the large magnetic disturbance of 29 October 2003, Ann. Geophys. 27, 2539-2544, 2009.

34. Manju G., C. V. Devasia and Sudha Ravindran, The seasonal and solar cycle variations of electron density gradient scale length, vertical drift and layer height during magnetically quiet days: Implications for Spread *F* over Trivandrum, India, Earth Planets and Space, 61, 1339-1343, 2009.

35. Manju G., T. K. Pant, C. V. Devasia, S. Ravindran, and R. Sridharan, electrodynamical response of the Indian low-mid latitude ionosphere to the very large solar flare of 28 October 2003 – a case study, Ann. Geophys., 27, 3853-3860, 2009.

36. Manju G., Sudha Ravindran, C. V. Devasia, Smitha V. Thampi and R. Sridharan, Plasmaspheric electron content (PEC) over low latitude regions around the magnetic equator in the Indian sector during different geophysical conditions, J. Atmos. Terr. Phys., 70, 1066-1073, 2008.

37. Manju G. and K. S. Viswanathan, VHF radar studies of counter electrojet events during the northern winter solstice period of 1992, Earth Planets Space, 59, 259, 2007.

38. Manju G., C. V. Devasia and R. Sridharan, On the seasonal variations of the threshold height for the occurrence of equatorial spread F during solar minimum and maximum years, Ann. Geophys., 25, 1, 2007.

39. Manju G., K.S. Viswanathan, Sudha Ravindran, Spatial and temporal variations of small scale plasma turbulence parameters in the equatorial electrojet: HF and VHF radar observational results, Ann. Geophys., 23, 1165-1173, 2005.

40. Manju G. and K.S. Viswanathan, Response of the equatorial electrojet to solar flare related X-ray flux enhancements, Earth Planets Space , 57, 231, 2005.

41. Manju G. and K.S. Viswanathan, Short period fluctuations in the equatorial electrojet electric fields, Indian Journal of Radio and Space Physics, 35, 90-97, 2005.

42. G. K. Mukherjee, Navin Parihar, K. Niranjan and **G. Manju**, Signature of Midnight Temperature Maximum (MTM) using OI 630 nm Airglow. Indian J. Rad. & Space Phys., 35, 14, 2005.

43. Manju G.., V. M. Chowdary, Y.K. Srivastava , A. Jeyaram and S. Adiga, Mapping and characterization of wetlands of East Champaran district, Bihar using Remote Sensing and GIS, Journal of Indian Society of Remote Sensing, 33, 1, 2005.

44. Manju G., Sudha Ravindran, Smitha V. Thampi and R. Sridharan, Study on ESF duration and strength at the magnetic equator in association with the duration and strength of L band scintillations in the EIA region *Proc. ECAR* (2008), 2009.