CURRICULUM VITAE

DR. AMBILI K. M.

SCIENTIST/ENGINEER-SD
SPACE PHYSICS LABORATORY
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DATE OF BIRTH: 29TH MAY 1986 SEX: FEMALE NATIONALITY: INDIAN

AREA OF SPECIFIC RESEARCH INTEREST

PLANETARY IONOSPHERIC STUDIES USING OBSERVATIONS AND MODELS

- Investigation of thermosphere ionosphere and magnetosphere region using ground and space based radio probing techniques (Ionosonde, Incoherent scatter radar, Global Navigation Satellite Systems).
- Terrestrial and Planetary ionospheric modeling.

PH.D. THESIS TITLE: A STUDY OF EQUATORIAL AND LOW LATITUDE PLASMA PROCESSES USING PHYSICS BASED IONOSPHERIC MODELS IN ASSOCIATION WITH GROUND BASED/ SPACE BORNE OPTICAL AND RADIO EXPERIMENTS.

ACADEMIC QUALIFICATIONS

	Degree	University/college	Marks obtained (%)	Year of completion
1	B.Sc. Physics	Kannur University	94.8	2006
2	M.Sc. Physics	Mangalore University	80.00	2008
3	Ph.D. Physics (Upper Atmospheric &Ionospheric Science)	Space Physics Laboratory, VSSC (Kerala University)	--	2014

CURRENT EMPLOYMENT

SCIENTIST/ENGINEER-SD
IONOSPHERE THERMOSPHERE MESOSPHERE PHYSICS
SPACE PHYSICS LABORATORY
VSSC, 695022

EMPLOYMENT AND NATURE OF DUTIES

Position	Institute	Duration	Nature of Duties

Research Associate	Space Physics Laboratory, VSSC, ISRO	April 2014 – April 2015	✓ Extension of one dimensional first principle model in to three dimensions ✓ Development of a photochemical model for lunar ionosphere ✓ Installation of Septentrio GPS receivers across Indian longitudes to study scintillation/TEC variabilities.
DST INSPIRE Faculty	Indian Institute of Space Science and Technology (IIST), Department of Earth and Space Sciences, Valiamala, Trivandrum	April 2015 -- Present	**Academic programs Participated**: ✓ B.Tech. Engineering Physics (Courses offered: Atmospheric radiation and climate) ✓ M.Tech. Earth System Sciences (Courses offered: Atmospheric radiation and climate, Satellite Meteorology and Oceanography, Ionosphere and Space Physics, Aerosols cloud climate interactions) **Areas of Specific Research Interest:** 1. The broad area of the research is the study of planetary ionospheres using observations and models. 2. This includes (1) The study of Earth's equatorial and low latitude plasma process using physics based ionospheric model. (2) Develop photochemical models for other planetary ionospheres. (3) Understanding ionospheric variabilities during different back ground conditions for the efficient functioning of IRNSS and SBAS systems

RESEARCH PROJECTS

Sl.No	Title	Funding Agency	Budget
1	Development of a Scientific payload for MOM -II mission of ISRO Advanced Space Qualified Retarding Potential Analyzer for the Martian Ionospheric Studies (ARIS)	ISRO (2017 -- 2020)	1000 lakhs
2	Announcement of Opportunity for IRNSS/GAGAN Navigation Data Utilization Program A study on the effects of ionospheric	SAC, ISRO Ahmedabad (2017 -- 2020)	26 Lakhs

	variabilities on the usability of IRNSS/GAGAN using observations and models		
3	Development of three-dimension first principle ionospheric model for equatorial/low latitude ionosphere	Department of Science and Technology (DST) (2015 -- 2020)	35 lakhs

SUPERVISION OF PROJECTS

B. Tech. : 1

M.Tech. : 4

M.Sc. : 1

Internship : 5

Project Research Fellow: 5

LIST OF SCIENTIFIC PUBLICATIONS

1) St-Maurice. J.-P, **K M Ambili**, R K Choudhary (2011), Local electrodynamics of a solar eclipse at the magnetic equator in the early afternoon hours, **Geophy.Res.Lett**.,38, L04102,doi:2010GL046085.
2) R K Choudhary, J-P. St.Maurice, **K M Ambili**, Surendra Sunda, B M Pathan (2011), The impact of the January 15,2010 annular eclipse on the equatorial and low latitude ionospheric densities, **J. Geophys. Res**., doi:2011JA016504.
3) **K. M. Ambili**, J.-P. St.-Maurice, and R. K. Choudhary (2012), On the sunrise oscillation of the F region in the equatorial ionosphere, **Geophy.Res.Lett**., 39, L16102, doi:10.1029/2012GL052876.
4) **K. M. Ambili**, R. K. Choudhary, J.-P. St.-Maurice and Jorge L. Chau (2013), Nighttime vertical plasma drifts and the occurrence of sunrise undulation at the dip equator: A study using Jicamarca incoherent backscatter radar measurements, **Geophy.Res.Lett**., 40, doi:10.1002/2013GL057837.
5) **K. M. Ambili,** R. K. Choudhary, and J.-P. St.-Maurice (2014), Longitudinal and seasonal variations in the occurrence of sunrise undulation at the dip equator: A study using Trivandrum and Jicamarca Digital Ionosonde measurements, **J. Geophys. Res**., doi:10.1002/2014JA019783.
6) R.K. Choudhary, **K.M. Ambili**, Siddhartha Choudhury, and Anil Bhardwaj (2016), On the origin of the ionosphere at the Moon using results from Chandrayaan-1 S-Band Radio Occultation Experiment and a photochemical model. **Geophy.Res.Lett.,** doi:10.1002/2016GL070612.
7) K Unnikrishnan, H Sreekumar, RK Choudhary, VM Ashna, **K M Ambili**, PR Shreedevi, PB Rao (2017), A study on the evolution of plasma bubbles using the single station-multi-satellite and Multi-station-single satellite techniques, **J. Geophys. Res. Space Physics**, 122, 1- 11, doi: 10.1002/2016JA023503

8) **K. M. Ambili**, R. K. Choudhary, The impact of meridional circulation changes on the electron density distribution over the Indian equatorial and low latitude region during a severe geomagnetic storm on 15 May 2005, **JASTP** (Under review since November 2017).

9) **K.M. Ambili**, V. Pralay Raj, R K Choudhary, Performance of Global Navigation Satellite Systems over Indian Equatorial region, Trivandrum, **Space Weather** (Under review since December 2017).

10) R K Choudhary, J-P.St.Maurice**, K M Ambili** and R Sridharan, On the multifaceted roles played by the neutral wind in the equatorial electrodynamics during magnetically disturbed times, **J. Geophys. Res**., (Under review since September 2017).

11) **K.M. Ambili**, Sneha Susan Babu, R. K. Choudhary, On the relative roles of the neutral density and photo chemistry on the solar zenith angle variations in the V2 layer characteristics of the Venus ionosphere under different solar activity conditions, **Icarus** (Under review since December 2017)

IMPORTANT SCIENTIFIC CONTRIBUTIONS:

- ✓ Developed **ISRO-Total Electron Content model**.
- ✓ Developed an **algorithm** for **radio occultation experiment** using Chandrayaan -1 for lunar atmospheric studies. *(Geophys. Res Lett.* 2016)
- ✓ Developed a time-dependent **quasi two- dimensional first principle ionospheric model** (*Geophys. Res Lett., 2012, 2013, J. Geophys. Res 2014).*
- ✓ Developed an **ionospheric model** for the **lunar ionosphere**. *(Geophys. Res Lett.* 2016)
- ✓ Developed a **photo chemical model** for the **Venusian ionosphere** *(Icarus, 2018)*
- ✓ First observation of **Double Pre- Reversal Enhancement** over the magnetic equator during a solar eclipse using ground based radio techniques. *(Geophys. Res Lett., 2011)*.
- ✓ Evidence for the **altitudinal reversal of electric field** during eclipse. *(J. Geophys. Res., 2011)*.
- ✓ Proposed **a new method for the calculation of Equatorial and Low Latitude Electric fields**. *(J. Geophys. Res., 2011)*.
- ✓ First ever evidence for the **role of photochemistry in the occurrence of Sunrise Oscillation** observed over magnetic equator inferred using Incoherent Scatter Radar and Digisondes. (*Geophys. Res Lett., 2012, 2013, J. Geophys. Res 2014).*
- ✓ Calculation of drift velocity of ionospheric irregularities using geostationary satellites (J. *Geophys. Res. 2017).*
- ✓ First observational evidence for the **multifaceted roles played by the neutral wind** in the equatorial electrodynamics during magnetically disturbed times''
- ✓ Quantification of ionospheric delays in the L5 and S band signals of Indian Regional Navigation Satellite Systems (IRNSS).

PUBLICATIONS AND PROCEEDINGS

- Peer Reviewed International Journals :**11** (7 published (GRL, JGR) & 4 communicated)
- National and International Proceedings : **6**
- Conferences/Symposia Presentations : ***18***
- Total citations : **42 (h-index : 4, i10 index-2)**

AWARDS & HONORS:

- International Union of Radio Science (URSI) - General Assembly and Scientific Symposium (GASS) Young Scientist Award, August 2017, Montreal, Canada
- Best Poster Award, Kerala Science congress, January 2017.
- URSI-Asia-Pacific Radio Science Conference (APRAS) Young Scientist Award, August 2016, Seoul, South Korea
- URSI- Regional Conference on Radio Science (RCRS) Young Scientist Award, November 2015, JNU New Delhi, India.
- Erasmus Mundus Scholarship for Post-doctoral research, March 2015.
- INSPIRE faculty award from DST, December 2014.
- ISRO Post-Doctoral Fellowship from Department of Space, Indian Space Research Organization (April 2014 – April 2015).
- ISRO Research Fellowship from Department of Space, Indian Space Research Organization leading to Ph.D. degree (January 2009 – January 2014).
- Deputed to Canada (Institute of Space and Atmospheric Sciences) on ISAS fellowship (May 2011).
- Selected as Best Student participated in SERC School, 2010.
- Qualified Graduate Aptitude Test in Engineering (GATE)-2010.
- Second Rank in M.Sc. Physics (2008) from University of Mangalore, Karnataka.

PROFESSIONAL MEMBERSHIPS:

- Member, International Union of Radio Science (URSI)
- Member, Indian Science Congress Association
- Member, COSPAR assembly

REVIEWER FOR INTERNATIONAL JOURNALS

- Journal of Atmospheric and Solar Terrestrial Physics, Elsevier.
- Journal of Earth System Science, Springer

PROFICIENCY IN COMPUTERS

Operating Systems	:	WINDOWS and LINUX
Programming Languages	:	FORTRAN and C++
Analytical Software	:	MATLAB, ORIGIN and GRADS

PAPERS ACCEPTED FOR PRESENTATION IN CONFERENCES

2011

1) Local electrodynamics of a solar eclipse at the magnetic equator in the early afternoon hours, St-Maurice. J.-P, K M Ambili, R K Choudhary, National workshop: Results on Solar Eclipse (NaWRoSE), SPL, VSSC, 27-28 January.

2) The impact of the January 15,2010 annular eclipse on the equatorial and low latitude ionospheric densities, R K Choudhary, J-P. St.Maurice, K M Ambili, Surendra Sunda, B M Pathan , National workshop : Results on Solar Eclipse (NaWRoSE), SPL, VSSC, 27-28 January.

3) Double pre-reversal enhancement observed over the magnetic equator in the early afternoon hours during a solar eclipse, St-Maurice. J.-P, K M Ambili,

R K Choudhary, National Conference on Advances in Atmospheric Remote Sensing, Weather Prediction and Climate Change, SV University, Tirupati, 10-11 March.

2012 4) On the sunrise oscillation of the F region in the equatorial ionosphere, K. M. Ambili, J.-P. St.-Maurice, and R. K. Choudhary, 17th National Space Science Symposium, SV University Tirupati, February 14-17.

5) Role of photochemistry in determining the characteristic features of sunrise oscillation of the F region in the equatorial ionosphere, K. M. Ambili, J.-P. St.-Maurice, and R. K. Choudhary, international Symposium on Equatorial Aeronomy, (ISEA-13), Paracas, Peru, 12-17 March.

6) Local electrodynamics of a solar eclipse at the magnetic equator in the early afternoon hours, St-Maurice. J.-P, K M Ambili, R K Choudhary, international Symposium on Equatorial Aeronomy, (ISEA-13), Paracas, Peru, 12-17 March.

7) The impact of the January 15, 2010 annular eclipse on the equatorial and low latitude ionospheric densities, R K Choudhary, J-P. St.Maurice, K M Ambili, Surendra Sunda, B M Pathan , International Symposium on Equatorial Aeronomy, (ISEA-13), Paracas, Peru, 12-17 March.

8) On the multifaceted roles played by the neutral wind in the equatorial electrodynamics during magnetically disturbed times, R K Choudhary, J-P.St. Maurice, K M Ambili, R Sridharan, 39th COSPAR Scientific Assembly, Mysore, July 14-22.

9) Role of neutral wind in determining the total electron content distribution during geomagnetic storm period over magnetic equatorial and low latitude regions, R K Choudhary, J-P. St. Maurice, K M Ambili, International symposium on solar-terrestrial physics, IISER Pune, 6-9 November.

2015 10) Role of prompt penetration electric field in determining the total electron content over Indian region during geomagnetic storm periods, K M Ambili, R K Choudhary, Indian Geophysical Union 52nd Annual Convention on 'Near Surface Earth System Science', National Centre for Antarctic and Ocean Research (NCAOR), GOA, November 3-5.

11) Origin of ionosphere on Moon, K M Ambili, R K Choudhary, 2nd URSI Regional Conference on Radio Science, Jawaharlal Nehru University, New Delhi, November 16-19.

12)Impact of geomagnetic storms on the energetics of the ionosphere, K M Ambili, National Seminar on Experimental astronomy and Space Science (NSETAS-2015), NSS Hindu college, Changanasseri, 14-16 December.

2016 13) Total Electron content distribution over equatorial and low latitude region during geomagnetic storm periods, K M Ambili, R K Choudhary, 19th National Space Science Symposium (NSSS), Space Physics Laboratory, VSSC, February 9-12.

14) On the possibilities of the existence of molecular ions in the lunar ionosphere: a study using results from Chandrayaan-I S-Band Radio Occultation Experiment and a photochemical model, K Ambili, R K Choudhary, URSI-APRASC, Seoul, South Kores, August 26-29.

2017 15) Morphological features of ionospheric irregularities estimated using geostationary satellites, Vagu Pralay Raj, K M Ambili, 29th Kerala Science Congress, Mar Thoma College, Tiruvalla, January 29-February 2.

16) The characteristics of dayside Venus ionosphere: a modeling approach, Sneha Susan Babu, K M Ambili, URSI RCRS 2017, NARL Tirupati, March 1-4.

17) Characteristic features of L1 and L5 scintillations over equatorial region, Trivandrum, Vagu Pralay Raj, K M Ambili, URSI RCRS 2017, NARL Tirupati, March 1-4.

18) Occurrence of Molecular ions on Lunar ionosphere, K M Ambili, R K Choudhary, Anil Bhardwaj and Siddhartha Choudhury, URIS-GASS, Montreal, Canada, August 20- 26

PARTICIPATION IN EXPERIMENTAL CAMPAIGNS:

Name of the Campaign	Place and Period	Major Responsibilities under taken
Solar Eclipse Campaign (Sooryagrahan 2010)	Space Physics Lab, VSSC, Trivandrum, India January 14-17, 2010	Operation of Optical Instruments, H.F.Radar, Meteor Wind Radar, Magnetometer and Ionosonde
Equatorial ionospheric irregularities	Space Physics Lab, VSSC, Trivandrum, India February – October, 2017	Operation of GNSS receivers