

CURRICULUM VITAE

Name : Grandhi Kishore Kumar
Date of Birth : 01-01-1980
Address : Department of Atmospheric & Space Science
Savitribai Phue Pune University
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Education

Ph.D., Department of Physics, **Sri Venkateswara University, Tirupati, A.P., India** Feb., 2009
Ph.D. Advisors: Dr. S. Vijaya Bhaskara Rao & Dr. M. Venkat Ratnam
Thesis: Studies on Low Latitude Stratospheric and Mesospheric Structure and Dynamics using Ground Based and Satellite Borne Measurements

M.Phil., Department of Physics, **Sri Venkateswara University, Tirupati, A.P., India** Jul., 2006
Advisor: Dr. S. Vijaya Bhaskara Rao
Dissertation: Climatology of Low Latitude Mesospheric Echoes Using Indian MST Radar

M.Sc., Department of Physics, **Govt. Arts College, Rajahmundry, A.P., India** Sep., 2002
Emphasis: Physics

B.Sc., C.S.R. Sarma College, Ongole, A.P., India Mar., 2000
Emphasis: Mathematics, Physics, Electronics

Work Experience

UGC-FRP Assistant Professor 09/2017-
Department of Atmospheric and Space Science
Savitribai Phule Pune University, Pune, India

Postdoctoral Fellow 06/2015-08/2017
Dr. Hilde Nesse Tyssøy Birkeland Centre for Space Science (BCSS)
University of Bergen, Bergen, Norway

Researcher-IUGONET 04/2014-03/2015
Prof. Toshikata Tsuda Research Institute for Sustainable Humanosphere (RISH)
Kyoto University, Uji, Gokasho, Japan

Alexander von Humboldt Fellow 04/2012-03/2014
Department of Radar Soundings and Sounding Rockets Leibniz-Institute of Atmospheric Physics
Kühlungsborn, Germany

Postdoctoral Fellow Dr. Werner Singer	08/2010–10/2011 Leibniz-Institute of Atmospheric Physics Kühlungsborn, Germany
Postdoctoral Fellow Prof. Wayne K. Hocking	05/2009–05/2010 University of Western Ontario London, ON, Canada
CSIR Senior Research Fellow Dr. S. Vijaya Bhaskara Rao	04/2008–05/2009 Sri Venkateswara University, Tirupati, A.P., India
Junior Research Fellow Dr. S. Vijaya Bhaskara Rao	03/2006–03/2008 Sri Venkateswara University, Tirupati, A.P., India
Lecturer in Physics	09/2003–03/2004 K.R. K. Govt. Degree College, Addanki, A.P., India
Lecturer in Physics	09/2002–09/2003 N.N.R. and C.L. Degree College, Ongole, A.P., India

Research Experience

I have been working in the field of middle atmospheric dynamics for more than a decade. My Ph.D thesis focused on studies on stratospheric and mesospheric structure and dynamics over low latitudes. In particular, I carried out an extensive study on climatology of low latitude mesospheric echoes and their possible source mechanism using Indian MST radar and co-located Rayleigh lidar including mean wind fields over low latitude mesospheric heights using MST radar, MF radar, rocket and HRDI/UARS observations. Apart from this, my dissertation work also includes the study of mean thermal structure of the middle atmosphere using Rayleigh lidar, rocket and SABER/TIMED observations and long term observations of the mesospheric QBO and SAO and their relation with stratospheric QBO.

In addition to the middle atmospheric dynamics, I involved in the studies related to lower atmosphere like the vertical wave number spectra of gravity waves using long term observations of MST radar and the behavior of the Hadley circulation during monsoon seasons.

During my first postdoctoral period, I worked on the High Latitude MLT dynamics using AxonMet radars at University of Western Ontario. During this period, I diagnosed the long term variation of MLT Winds, Tides and Planetary Waves over Northern polar latitudes with more emphasis on Resolute Bay (75°N).

During the second postdoctoral period, I worked in CAWSES project. Main theme of the project is Atmospheric coupling by gravity waves: climatology of gravity wave activity, mesospheric turbulence and their relation to solar activity. During this period, I examined the long term trends in MLT winds over mid and polar latitudes and involved in the studies of long term trends in GWs over mid and polar latitudes. I also examined the tidal behavior over southern low latitudes with observations and models. More interesting study is estimation of migrating tides from meteor radar observations.

During Alexander von Humboldt Fellowship, I worked on the theme QBO influence on MLT winds. I inspected long term behavior of tropical MLT zonal winds. The sudden enhancements in westward wind during spring equinox are interpreted as QBO modulation on MLT winds. Latitudinal variability of QBO modulation on MLT winds and model evaluations on this topic are under progress. During my stay at Research Institute for Sustainable Humanosphere (RISH), Kyoto University, Japan, I studied long term trends of the earth atmosphere in different layers using the long term observations available through IUGONET. During my stay at BCSS, Norway I studied the influence of the Geomagnetic disturbance on the middle atmosphere and surface temperature patterns.

Aside from these, I also involved in CAWSES-INDIA phase II and examined long term trends in low latitude mesospheric zonal winds.

Other Professional Activities

Reviewer for Journal of Geophysical Research; Journal of Atmospheric and Solar-Terrestrial Physics;
Advances in Space Research; Annales Geophysicae; Theoretical and Applied Climatology
AGU member since 2006
AOGS member since 2013
JPGU member since 2014

Awards and Grants

Research Fellowship from the Alexander von Humboldt Foundation, Germany, “Long period oscillations in the mesosphere and lower thermosphere and their relation to solar cycle”, April 2012 – March 2014

Principal Investigator, “Study on long-period oscillations in the tropical middle atmosphere and influence of solar cycle on these oscillations”, CAWSES-India Phase-II, 2010-2013.

Postdoctoral Fellowship from the Swedish Research Council, “Mesospheric echoes over polar and tropical latitudes: Generation mechanism and application to study turbulence in the middle atmosphere” May 2010 (Declined)

Senior Research Fellowship from Council of Scientific and Industrial Research (CSIR), India, “Study on mesospheric dynamics using Indian MST Radar and Rayleigh Lidar” April 2008-May2009.

Students Guided

Master

Joakim Kuven Osland, Energetic particle precipitation and polar surface air temperature variability, *University of Bergen*, 2015-2017

Supervisors : Hilde Nesse Tyssøy, **Kishore Kumar G**, and Yvan Orsolini

Research Interests

- Radar and satellite remote sensing of Earth's atmosphere
- Atmospheric Dynamics with special emphasis on middle atmosphere
- Vertical coupling of the atmosphere through gravity waves, tides and planetary waves
- Atmospheric Turbulence
- Climatological studies of atmospheric parameters in various regions of atmosphere
- General circulation models

Computational Skills

Languages : Matlab, FORTRAN, Python, R (learning)

Operating Environment: UNIX, DOS, WINDOWS

Software : Familiar with all PC word processing and graphics
Software and Internet tools

* I am capable of learning any computer language /software if it is required for my research

List of Publications

A) Articles in journals/Contributions to books

1. Smith-Johnsen, C., H. Nesse Tyssøy, K. Hendrickx, Y. Orsolini, G. Kishore Kumar, L.-K.G. Ødegaard, M.I. Sandanger, F. Stordal, and L. Megner, Direct and indirect electron precipitation effect on nitric oxide in the polar middle atmosphere using a full-range energy spectrum (2017), *J. Geophys. Res.*, 122, 8679-8693, doi: 10.1002/2017JA024364.
2. **Kishore Kumar, G.**, Kishore Kumar, K., Baumgarten, G., and Ramkumar, G., Validation of MERRA reanalysis upper-level winds over low latitudes with independent rocket sounding data (2015), *J. Atmo. Sol. Terr. Phys.*, 123, 48-54, doi:10.1016/j.jastp.2014.12.001.
3. **Kishore Kumar, G.**, K. Kishore Kumar, W. Singer, C. Zülicke, S. Gurubaran G. Baumgarten, G. Ramkumar, S. Sathishkumar Kumar and M. Rapp, Mesosphere and lower thermosphere zonal wind variations over low latitudes: Relation to local stratospheric zonal winds and global circulation anomalies (2014), *J. Geophys. Res. Atmos.*, 119, 5913-5927, doi:10.1002/2014JD021610.
4. **Kishore Kumar, G.**, Werner Singer, J. Oberheide, Norbert Grieger, P.P. Batista, D. M. Riggin, H. Schmidt, and B. R. Clemesha: Diurnal tides at low latitudes: Radar, satellite, and model results (2014) , *J. Atmo. Sol. Terr. Phys.*, 118, part A, 96-105, doi:10.1016/j.jastp.2013.07.005.
5. Venkat Ratnam, M., **G. Kishore Kumar**, N. Venkateswara Rao, B. V. Krishna Murthy, J. Laštovička, and L. Qian (2013): Evidence of long-term change in zonal wind in the tropical lower mesosphere: Observations and model simulations, *Geophys. Res. Lett.*, 40, 397-401, doi:10.1002/grl.50158.
6. Venkat Ratnam, M., **G. Kishore Kumar**, S. Eswaraiah, and S. Vijaya Bhaskara Rao (2013): Morphology of tropical mesospheric echoes observed by VHF radar. *Earth, Planets, and Space*, 65, 97-102, doi:10.5047/eps.2012.06.010.

7. Werner Singer, Peter Hoffmann, **G. Kishore Kumar**, Nicholas J. Mitchell, and V. Matthias (2012): Atmospheric Coupling by Gravity Waves: Climatology of Gravity Wave Activity, Mesospheric Turbulence and Their Relations to Solar Activity, in *Climate And Weather of the Sun-Earth System (CAWSES): Highlights from a priority program*, Springer, F.-J. Lübken, Dordrecht, The Netherlands, 409-427, doi:10.1007/978-94-007-4348-9.
8. Hocking, W.K., and **G. Kishore Kumar** (2011): Long term behaviour of the MLT quasi 7 day wave at two Radar sites at Northern Polar latitudes, *J. Atmo. Sol. Terr. Phys.*, **73**, 1616-1628, doi:10.1016/j.jastp.2011.02.004.
9. **Kishore Kumar, G.**, and W. K. Hocking (2010): Climatology of northern polar latitude MLT dynamics: mean winds and tides, *Ann. Geophys.*, **28**, 1859-1876, doi:10.5194/angeo-28-1859-2010
10. **Kishore Kumar, G.**, M.V. Ratnam, A.K. Patra, S.V.B. Rao, and James Russell (2008): Mean thermal structure of the low latitude middle atmosphere studied using Gadanki Rayleigh Lidar, Rocket and SABER/TIMED observations, *J. Geophys. Res.*, **113**, D23106, doi: 10.1029/2008JD010511.
11. Ratnam, M. V., **G. Kishore Kumar**, B.V.K. Murthy, A. K. Patra, V.V.M.J. Rao, S.V.B. Rao, K.K. Kumar, and G. Ramkumar (2008): Long-term variability of the low latitude mesospheric SAO and QBO and their relation with stratospheric QBO, *Geophys. Res. Lett.*, **35**, L21809, doi:10.1029/2008GL035390.
12. Roja Raman, M., V.V.M. J. Rao, M.V. Ratnam, **G. Kishore Kumar**, A.N. Babu, S.V. B. Rao, N. P. Rao, and D.N. Rao (2008): Atmospheric Circulation during active and break phases of Indian summer monsoon: A study using MST radar at Gadanki, *J. Geophys. Res.*, **113**, D20124, doi: 10.1029/2008JD010341.
13. **Kishore Kumar, G.**, M. V. Ratnam, A. K. Patra, V. V. M. J. Rao, S.V. B. Rao, K.K. Kumar, S. Gurubaran, G. Ramkumar, and D.N. Rao (2008): Low- Latitude Mesospheric Mean Winds Observed by Gadanki MST Radar and Comparison with Rocket, HRDI, MF Radar measurements and HWM93, *J. Geophys. Res.*, **113**, D19117, doi:10.1029/2008JD009862.
14. Narendra Babu, A., K. K. Kumar, **G. Kishore Kumar**, M.V. Ratnam, S. V.B. Rao, and D.N. Rao (2008): Long-term MST radar observations of vertical wave number spectra of gravity waves in the tropical troposphere over Gadanki (13.5°N, 79.2°E): Comparison with model spectra, *Ann. Geophys.*, **26**, 1671-1680.
15. **Kishore Kumar, G.**, M.V. Ratnam, A.K. Patra, V.V.M.J. Rao, S.V.B. Rao, and D. N. Rao, (2007): Climatology of low- latitude mesospheric echo characteristics observed by Indian MST Radar, *J. Geophys. Res.*, **112**, D06109, doi: 10.1029/2006JD007609.

B) Published contributions to academic conferences

1. **Kishore Kumar, G.**, M. V. Ratnam, A. K. Patra, K.K. Kumar, G. Ramkumar, S. Gurubaran, and S.V.B. Rao (2009): Long-term variations of low latitude mesospheric mean winds observed using Indian MST radar, MF radar, M-100 rocketsondes and HRDI measurements. Proceedings of the 12th international workshop on technical and scientific aspects of MST radar, London, Canada, May 2009, 247-250.
2. **Kishore Kumar, G.**, M.V. Ratnam, A.K. Patra, V.V.M.J. Rao, A.N. Babu, S.V.B. Rao, and D. N. Rao (2006) : Climatology of Low-Latitude Mesospheric Echo Characteristics Observed by Indian MST Radar. Proceedings of the 11th international workshop on technical and scientific aspects of MST radar, Gadanki, India, December 2006, 158-162.
3. Roja Raman, M., V.V.M.J. Rao, **G. Kishore Kumar**, M. V. Ratnam, A.N. Babu, S.V.B. Rao, and D.N. Rao (2006): Characteristic Features of Indian Summer Monsoon – A Statistical Study using Indian MST Radar. Proceedings of the 11th international workshop on technical and scientific aspects of MST radar, Gadanki, India, December 2006,562-565.
4. Narendra Babu, A., M.V. Ratnam, **G. Kishore Kumar**, M. Roja Raman, V.V.M.J. Rao, S.V.B. Rao, D. N. Rao (2006): A Statistical Study of the Gravity Wave Activity over a Low-Latitude Station, Gadanki using MST Radar. Proceedings of the 11th international workshop on technical and scientific aspects of MST radar, Gadanki, India, December 2006, 634-638.