

# INDIAN INSTITUTE OF TROPICAL METEOROLOGY, PUNE



## THE TWENTY SIXTH SILVER JUBILEE AWARD FOR THE YEAR 2013

*To commemorate the Silver Jubilee of the Institute, the Governing Council established in March 1989, an Annual Silver Jubilee Award for the best research contribution in the form of published paper in standard research journal by the Institute's scientist(s). The award presently carries a cash reward of ₹. 25,000/- and a citation.*

*The Twenty Sixth Silver Jubilee Award goes to the paper entitled*

**“In situ measurements of aerosol vertical and spatial distributions over continental India during the major drought”**

*Published in the Journal *Atmospheric Environment*, 80, 2013,  
DOI:10.1016/j.atmosenv.2013.07.064,107-121*

*by*

**B. Padmakumari, R.S. Maheshkumar, G. Harikishan, S.B. Morwal,  
T.V. Prabha and J.R. Kulkarni**

*which has been adjudged to be the best research contribution of the year 2013.*

*The variability in aerosol vertical and spatial distribution over the continental Indian region is studied using the airborne observations during the Cloud Aerosol Interactions and Precipitation Enhancement EXperiment (CAIPEEX) from May to September, 2009. The fine mode (0.1-3.0  $\mu\text{m}$ ) aerosol vertical profiles up to 6 km at different regions showed different vertical structures mostly influenced by the atmospheric boundary layer (ABL) depth as well as the origin of air mass trajectories and the presence of clouds. Elevated aerosol layers are observed during pre-monsoon and during monsoon at some locations but comparatively lower than the one observed in the boundary layer. During monsoon, aerosol number concentration showed strong vertical gradient and a transition is observed between the boundary layer and the free troposphere. The coarse mode ( $>3 \mu\text{m}$ ) aerosol vertical profiles also showed elevated layers at higher altitudes due to the incursion of dry air laddened with dust. The spatial distribution shows significant variation at the elevated layers as compared to that in the boundary layer during premonsoon, while high variability is observed in the boundary layer during monsoon. The frequency distribution of different aerosol types from Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation (CALIPSO) showed dominating contributions from dust, polluted dust and smoke during pre-monsoon. During monsoon also traces of these pollutants were found to be high as the year 2009 is a drought year with rainfall deficiency of 22%. The surface level number concentration and the height of ABL are found to influence the aerosol optical depths significantly.*

*This citation is presented to*

**B. Padmakumari**

*in recognition of her contribution to the above research paper.*

**Dr. (Smt.) B. Padmakumari** joined the Indian Institute of Tropical Meteorology in April 1999 and is a Scientist of the institute. Her specialization includes aerosol-cloud-radiation and their interactions. She has made important contributions in the area of remote sensing of atmospheric aerosols, radiation and cloud macro and microphysics using ground-based, *in-situ* and satellite observations.

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*This citation is presented to*

**Thara Prabhakaran**

*in recognition of her contribution to the above research paper.*

Dr. (Smt.) Thara Prabhakaran joined the Indian Institute of Tropical Meteorology in December 2008. Her specialization includes studies on the physics and dynamics of clouds. She has made important contributions in the area aerosol-cloud-dynamical interactions using CAIPEEX observations and numerical simulations and is currently The Chief Project Scientist of Physics and Dynamics of Tropical Clouds.

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*This citation is presented to*

**S.B. Morwal**

*in recognition of her contribution to the above research paper.*

Dr. (Smt.) S.B. Morwal joined the Indian Institute of Tropical Meteorology in 1981 and is a Scientist of the institute. Her specialization includes cloud-aerosol interactions and microphysics of tropical clouds. She has made important contributions in the area physics and dynamics of tropical clouds using radiosonde and aircraft microphysical observations.



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*This citation is presented to*

**J.R. Kulkarni**

*in recognition of his contribution to the above research paper.*

Dr. J.R. Kulkarni joined the Indian Institute of Tropical Meteorology in 1973. He was Program Manager of the CAIPEEX program and was an adviser to the CAIPEEX and NFAR programs of the Institute. He is "WMO Expert Committee Member of Weather Modification". His specialization includes aircraft observations of clouds, and cloud physics. He has made important contributions in the area of aerosol-cloud interactions and cloud seeding using CAIPEEX observations.

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*This citation is presented to*

**R.S. Maheshkumar**

*in recognition of his contribution to the above research paper.*

Dr. R.S. Maheshkumar joined the Indian Institute of Tropical Meteorology as a Scientist in 2005. His specialization includes aerosol-cloud-precipitation interactions, aircraft observations of clouds, and cloud physics. He has made important contributions in the area of aerosol-cloud interactions using CAIPEEX observations.

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*This citation is presented to*

**Harikishan Gandham**

*in recognition of his contribution to the above research paper.*

Shri Harikishan Gandham joined the Indian Institute of Tropical Meteorology in 2010 as IITM Research Fellow and is working on aerosol-cloud interactions using observational data. His areas of specialization include radiative transfer model, satellite data retrievals, aerosol science and cloud physics.