

**Government of India
Ministry of Earth Sciences**

PRESS RELEASE

Winter Fog Experiment (WIFEX 2016-17)

Fog is a visible mass consisting of cloud water droplets suspended in the air or near the Earth's surface. The presence of heavy and extended period fog in the northern regions of India is one of the major weather hazards, impacting aviation, road transportation, economy and public life in the world's most densely populated region. Maximum fog occurrence over the Northwest India is about 48 days (visibility < 1000m) per year, and occurs mostly during the December-February time period. All India annual morning poor visibility days (PVD <4 km) has increased from 6.7 to 27.3 % days. Recent studies on fog in India during the past 10-15 years have prompted significant socio-economic concern due to increase in frequency, persistence and intensity of fog occurrence over the northern parts of the country. Land use changes and increasing pollution in the region are responsible for growing Fog occurrence.

The objectives of the Winter Fog Experiment (WIFEX) are to develop better now-casting (next 6 hours) and forecasting of winter fog on various time and spatial scales, and help reduce its adverse impact on aviation, transportation and economy, and loss of human life due to accidents. We need a reliable forecasting system for Fog occurrence. The physical and chemical characteristics of fog, meteorological factors responsible for its genesis, sustenance, intensity and dissipation are poorly understood. Similarly, meteorological conditions like humidity, wind and synoptic conditions are also not well studied. Improved understanding on above aspects is required to develop reliable forecasting models and observational techniques for accurate prediction of Fog events.

In an effort to gain insight into these questions, the Ministry of Earth Sciences (MoES), Government of India has taken up a multi-institutional initiative to conduct an intensive ground-based measurement campaign at the Indira Gandhi International Airport (IGIA), Delhi, to understand different physical and chemical features of Fog and factors responsible for its genesis, intensity and duration. WIFEX was conducted in a pilot mode at IGIA during last winter, and will be continued during December 2016 till February 2017. The main scientific objective of this project is to study the characteristics and variability of fog events and associated dynamics, thermodynamics and fog microphysics, with the aim to achieve better understanding of fog life cycle and ultimately improve capability in fog prediction.

Extensive sets of comprehensive ground-based instrumentation, including remote sensing platforms, are deployed at the Indira Gandhi International Airport (IGIA), New Delhi. Major in-situ sensors are deployed to measure surface micro meteorological conditions, radiation balance, turbulence, thermo-dynamical structure of the surface layer, fog droplet and aerosol microphysics, aerosol optical properties, real time sky images, and aerosol and fog water chemistry to describe the complete environmental conditions in which fog develops. These measurements will form the basis for understanding the some of the key questions on fog formation and dispersion. With these measurements, modeling efforts also will be made with the ultimate aim to improve the prediction skill. These observation from intense campaign will be further used to validate model forecasts and to improve model capability. It is proposed to introduce this model for operational forecasts of Fog for the winter season of 2017-18.

The Airport Authority of India and GMR, Indira Gandhi International Airport have extended full cooperation and support. In addition to Indian Institute of Tropical Meteorology (IITM), Pune, India Meteorology Department (IMD), National Center for Medium Range Weather Forecast (NCMRWF), and Indian Institute of Science Education and Research (IISER) Mohali are also participating in this observational campaign. For modeling efforts, IITM Pune and NCMRWF are also involved.

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*Contact for further details: Dr. Sachin Ghude, Scientist, Indian Institute of Tropical Meteorology (IITM), MoES.
(Tel No: 020- 25904350, Email ID: sachinghude@tropmet.res.in)*