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Winter Fog Experiment (WiFEX) at Delhi International Airport, India: Results from 2015-2019 winter campaign

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Abstract

Context By considering the national interests and key research issues it is important to consider how future research on fog modeling and forecasting will be organized so that it will most effectively address the issues that are important for public services in India. Therefore, Ministry of Earth Sciences (MoES), Government of India (GoI) has taken a multi-institutional lead in understanding broad aspects of winter-time haze and fog formation over northern regions of India, and for developing a suitable fog forecasting system that has relevance to all sectors and policy issues.

Methods The WIFEX project was designed to study the characteristics and variability of fog events and improve understanding some of the key questions on fog formation and dispersion.

Results From a numerical modeling point of view the project was designed to improve understanding of the key parameters needed for physical parameterization of fog to improve its prediction. This study provides results on fog thermo dynamical, microphysical and chemical analysis. We found that the fog particles grew larger and number concentration increased uniformly with time along entire diameter ranges when condition changes from the non-foggy to the foggy condition. Hence it is most likely that the particles grew larger by vapor deposition/collection processes.

Interpretation This paper will present the brief overview of microphysical, chemical and thermo dynamical properties of fog from the measurements carried out in Delhi under the WiFEX campaign followed by evaluation of fog forecast demonstrated using the IITM-WRF product.

Conclusion It is challenges in visibility forecasting for airport will be discussed in this research.