



# ***CAIPEEX: Indian Cloud Seeding Scientific Experiment***

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The demand for effective methods to augment precipitation over arid regions of India has been increasing over the past several decades as the changing climate brings warmer average temperatures. In the fourth phase of the Cloud Aerosol Interaction and Precipitation Enhancement Experiment (CAIPEEX IV), a scientific investigation was conducted over a rain-shadow region of the Western Ghats mountains in India. The primary objective was to investigate the efficacy of hygroscopic seeding in convective clouds and to develop a cloud seeding protocol.

CAIPEEX IV followed the World Meteorological Organization (WMO) recommendations in a peer-reviewed report with physical, statistical, and numerical investigations. The initial results of the campaign in the monsoon period of 2018 and 2019 with two instrumented aircraft, a ground-based dual-polarization C-band radar, a network of rain gauges, radiosondes, and surface aerosol measurements are reported here. The hygroscopic seeding material was detected in cloud droplets and key cloud microphysical processes in the seeding hypothesis were tracked. The formidable challenges of assessing seeding impacts in convective clouds and the results from 150 seed and 122 no-seed samples of randomized experiments are illustrated. Over 5,000 cloud passes from the airborne campaign provided details about the convective cloud properties as the key indicators for a seeding strategy and the evaluation protocol.

The experimental results suggest that cloud seeding can be approached scientifically to reduce uncertainty. The results from this study should interest the scientific community and policymakers concerned with climate change's impact on precipitation and how to mitigate rainfall deficiencies.

**Thursday, 19 December 2024, 2:00PM**

**Refreshments 1:45PM**

**Please also join colleagues for refreshments and informal discussion after the seminar until 3:30pm**

NCAR-Foothills Laboratory, 3450 Mitchell Lane

FL2-1022, Large Seminar

**Seminar will also be live webcast**

<https://operations.ucar.edu/live-mmm>

Participants may ask questions during the seminar via Slido.