



Precipitation Nowcasting in the Core Monsoon Zone Using Dual-Polarization C-Band Radar

Subrata Kumar Das, Shruti Saini, Yogesh K. Kolte, U. V. Murali Krishna and Sachin Deshpande
Indian Institute of Tropical Meteorology, Ministry of Earth Sciences, Pune 411 008, India; e-mail:subrata@tropmt.res.in

Nowcasting provides detailed descriptions of current weather conditions and forecasts for the next 0-6 hours, offering timely and location-specific predictions. Short-term forecasts typically rely on extrapolation from observations, statistical models, and numerical weather prediction (NWP) methods. However, the variability of precipitation across broad spatial and temporal scales, along with the inherently chaotic nature of the atmosphere, constrains the ability to predict its evolution accurately.

Weather radars, offering high-resolution input data, are crucial for precipitation nowcasting. This study aims to assess the added value of radar-based rainfall nowcasting in the Core Monsoon Zone, Silkheda, where a dual-polarization C-band radar has been established. Our investigation focuses on two main areas:

- a. Evaluating the skill of probabilistic nowcasting for various types of rainfall events to understand its effectiveness across different precipitation scenarios.
- b. Analyzing the variation in nowcasting skill with different spatial resolutions and rain rates to identify the optimal conditions for accurate and reliable forecasts.

It is observed that the skill of nowcasting tends to decrease with increasing lead time or higher intensity thresholds. Additionally, the Fraction Skill Score (FSS) tends to decrease with higher intensity thresholds and when the spatial scale is reduced, indicating that nowcasting skill is inversely related to both the intensity threshold and the spatial resolution.

Details will be presented in the upcoming symposium

Keywords : Monsoon, Nowcasting, C-band radar, Core Monsoon Zone