Location Specific Weather Predictions for Sriharikota through Numerical Atmospheric Models during PSLV-C11 and PSLV-C12 Launch Campaigns

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Accurate knowledge of different meteorological parameters over a launch site is very crucial for effecient management of satellite launch operations. Lo- cal weather over the Indian satellite launch site located at Sriharikota High Altitude Range (SHAR: 13.72N, 80.22E) is very much dependent on the atmospheric circulation prevailing over the Bay of Bengal Oceanic region and topography induced convective activities. With a view to providing severe weather threat prediction in terms of Launch Commit Criteria (LCC), two numerical atmospheric models namely High-resolution Regional Model (HRM) and Advanced Regional Prediction System (ARPS) are made operational over SHAR in a synoptic and mesoscale domain respectively. In the present research article, two launch campaigns through Polar Satellite Launch Vehicle (PSLV-C11 and PSLV-C12) when contrasting weather conditions prevailed over the launch site are chosen for demonstration of potential of two models in providing location specific short to medium range weather predictions meeting the needs of LCC. In the case of PSLV-C11 campaign, when the launch site underwent frequent thundershower associated rainfall, ARPS model derived meteorological fields were effectively used in prediction of probability of the wet spells. On the other hand, Bay of Bengal underwent severe cyclonic storm during PSLV-C12 campaign, and its formation was reasonable captured through HRM simulations. It is concluded that a combination of HRM and ARPS provide reliable short to medium range weather prediction over SHAR, which has got profound importance in launch related activities.

Keywords: ARPS; Chandrayaan; HRM; Numerical Weather Prediction; Launch-Commit Criteria; Nowcasting; Thunderstorms.