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Numerical forecasting at ALMA observatory using WRF data assimilation

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The ALMA (Atacama Large Millimeter Array) observatory is located in the Chajnantor plateau in the North of Chile, at 5100 m of height. This is a region with scarce observations, clear skies and dry conditions during a large part of the year.
The present study uses WRF data assimilation to improve the numerical weather forecasts of near-surface variables and precipitable water vapor (PWV) at ALMA observatory. Four days were selected, two of them showed large PWV values as a result of the influence of synoptic scale perturbations on the region, and the other two showed very low PWV values. A number of simulations with different data assimilation combinations and a Control simulation were performed for each of these 4 days to analyze their influence on the weather forecasts at the site. Assimilating data only in the innermost domain (1km horizontal resolution) seems to provide the best results.