

SATELLITE RADAR INTERFEROMETRY FOR WATER VAPOR DISTRIBUTION MONITORING: TOWARDS A METEOROLOGICAL PRODUCT

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Satellite synthetic aperture radar interferometry (InSAR) is an imaging technique sensitive to mm-level variability in the vertically integrated water vapor column. Independent of cloud cover or solar illumination, the fine resolution (down to 20 m), enables quantitative measurements of mesoscale convective processes. One drawback of the technique was the fact that at least two acquisitions with a temporal interval of days are necessary to obtain a water vapor map. This requirement introduced an acquisition ambiguity in the data, since only the difference of the two atmospheric states could be measured.

Here we present a new methods to resolve this acquisition ambiguity, using long time series of radar imagery and two independent methodologies for ambiguity resolution. The first, the *single master stack*, combines all acquisitions with one reference. The second, the *cascade approach* finds the best combination of all images to subsequently correct them.

Apart from new opportunities in terms of new satellites and acquisition planning, these improvements in data processing can increase the meteorological relevance of Interferometric Radar Meteorology.