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Atmospheric Measurement Techniques Discussions

Interactive comment on "Differential absorption radar techniques – Part 1: Surface pressure" *by* L. Millán et al.

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[12pt]article color

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Response to reviewer 2: Differential absorption radar techniques: Surface pressure

17 October 2014

We sincerely thank the reviewer 2 for his/her thoughtful comments on the previous draft, we hope this new version is more suitable for publication.
In the course of making the corrections, we decided to change the title to: 'Differential absorption radar techniques: surface pressure' deleting the 'part 1' since the next part will be about either pressure profiles retrievals or water vapor retrievals. Below are our responses to the reviewers comments in red.

The paper examines the precision and accuracy which could be expected using differential absorption of satellite radar echoes close to 60 GHz to measure surface pressure. The theory and methods are clearly presented and the number of computations made to illustrate the results for different atmospheric conditions is large and adequate for the task.
The paper would benefit from some discussion of the precision/accuracy requirements for prospective users
The following sentence was added at the end of Section 5 (Error characterization and

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tone selection): Furthermore, these measurements should provide useful constraints for numerical weather forecasting [Flower1978, Lin2005] closing the large gaps in the measured surface pressure coverage particularly over the oceans. The quantitative impact of these measurements needs to be investigated using an Observing System Simulation Experiments (OSSE) or similar technique to study the impact on data assimilation and forecast system performance.

In addition there are a number minor corrections needed :

page 5797, line 5 'these method' should be 'this method' or 'these methods'
Done

page 5797, line 6 ', region ' should be , a region'
Done

page 5797, line 18 'Such wide spectral region' should be 'Such a wide spectral region'
Done

page 5797 line 24 'absorptions measurements are cover ' should be 'absorption measurements are covered '
Done

page 5802, lines 8 and 9 'Precipitating ice was modeled using the snow size distribution of Sekhon and Srivastava (1970). An exponential function derived from extensive field studies.' should probably be 'Precipitating ice was modeled using the snow size distribution of Sekhon and Srivastava (1970), an exponential function derived from

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extensive field studies.'
Done

page 5803, line 16 'wind surface ' should probably be 'surface wind '
Done

page 5804, lines 11,12 'used to retrieved' should be 'used to retrieve '
Done

page 5807, line 3 'retrievals allows us to select the radar tones which minimizes' should be 'retrievals allow us to select the radar tones which minimize'
Done

page 5807, line 23 'spectral differences in the target optical properties increases' should be 'spectral differences in the target optical properties increase'
Done

page 5808, line 4 'specific types scenarios' should be 'specific types of scenario'
Done

page 5809, line 2 'a ocean' should be 'an ocean '
Done

page 5809, line 12 'depends' should be 'depend'
Done

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page 5810, line 10 ‘betqter’ should be ‘better’
Done

Caption for figure 1 ‘wind surface’ should perhaps be ‘ surface wind’
Done

Caption for figure 4 states ‘In each scenario, linear regressions for all cases as well as separated by total hydrometeors column are shown. ’ It is not clear what this means - there is only one regression line on each plot, no separate regression lines for different column contents. Please clarify.
Deleted, that sentence was for a previous figure that include those linear regressions but that version of the figure was to cluttered.

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