Geoscientific

Model Development

Discussions

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comment

Interactive comment on "PAMTRA 1.0: A Passive and Active Microwave radiative TRAnsfer tool for simulating radiometer and radar measurements of the cloudy atmosphere" *by* Mario Mech et al.

Anonymous Referee #1

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The manuscript "PAMTRA 1.0: A Passive and Active Microwave radiative TRAnsfer tool for simulating radiometer and radar measurements of the cloudy atmosphere" by Mech et al., presents a new model to simulate polarized microwave measurements with passive or active sensors. The model is highly versatile. It can be applied to different observation geometries and able to be extendeded to new scattering or absoprtion inputs. The original feature of the PAMTRA is its ability compute the Doppler velocity spectrum of radar measurements. Examples of simulations are provided that give a good idea of the model capabilities.

The paper is clearly written and should be published in the journal. I would only like to

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Discussion paper

raise the following minor points.

1) I think more information are needed about the limitations of the model. I have noticed for examples the following points. What are the limitations due to the "column independent approximation" (P5 L12). What is the maximum range for the elevation angle? Would it be possible to quantify "strong scattering" (P5, L14) and "strong precipitation . . . large radar footprint" (P6, L26).

2) Sect. 2.1: What are the atmospheric input ? (temperature, pressure, humidity, trace gas profiles ?). I think that the radiative transfer equation solved by RT4 should be written. It is the core of PAMTRA for passive observations and it will help to better understand the model simplifications.

3) Sect. 2.2: The pulse width is not discussed for radar simulations. Is-it a model parameter? I think it will have an effect on the spectral width and on the measurement vertical resolution ? Is the latter computed? (I did not see any description of it in the manuscript)

Technical corrections:

P7L21: ".. dynamical and instrument effects such as attenuation . . .". Atmospheric attenuation is not "dynamics" nor "instrument". The sentence should be rephrased.

P8, L15: To my knowledge, N2 does not have resonant lines in the microwave domain but it contributes to the continuum absorption. This contribution is included in a dry continuum term in Liebe together with a contribution from O2. This should be corrected.

P3, Fig.2: What are the spatial coverage and resolution of the maps?

P18,L10: correct [3] in "up to [3]km"

P18L22: correct "model" in "Rosenkranz 98 m odel"

Fig.6 caption: correct "denotes" in "The white line denote . . ."

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