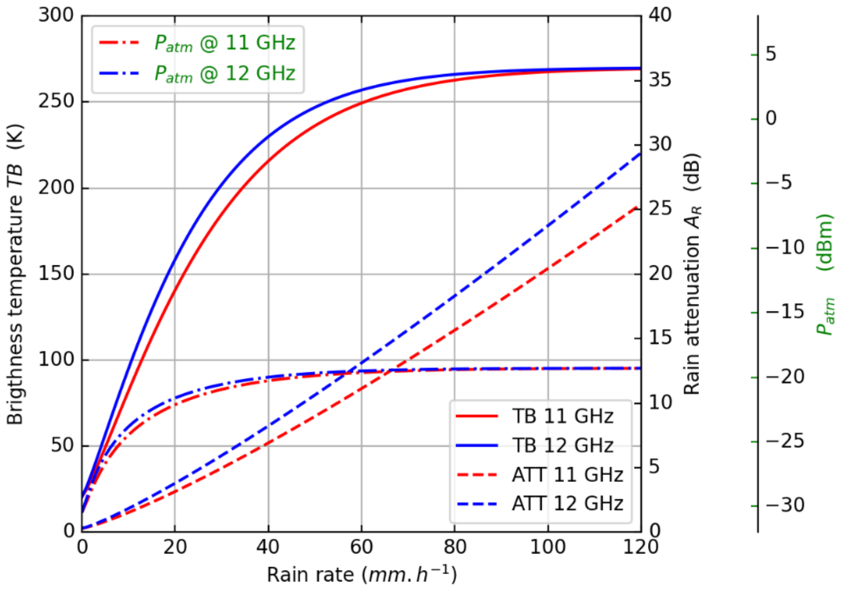
Collective response

Notes on figure 1:

- Fig 1: It is good to see P_atm in this plot now. One minor, but important, improvement would be to use the same scaling for A_r and P_atm on the two y-axis, because these are the two „competing“ processes and it would be easier to judge which process is the dominating one at which rain rates. P_atm could also be scaled so that it starts at the bottom of the plot for zero rain rates.
- the authors should add in Fig 1's caption and in thetext how Fig 1 was obtained (from simulations I guess - but it should be clarified)

Answer : done



Caption: *Simulated* sky brightness temperature TB (solid lines), atmospheric induced power Patm at the LNB output (dashed-dotted lines) and atmospheric attenuation (dashed lines) at 11 and 12 GHz for a zenith angle of 45°, with a zero isotherm at 3 km as a function of rain rate for a standard commercial TV-SAT LNB (1 GHz bandwidth, 65 dB gain).

Fig 3 and 4: Why are the paths only plotted for one site in Fig 4? If this is to make the plot less busy, that is okay. But it should be mentioned in the caption that paths are only shown for one site. Alternatively, you could, of course, plot all paths as it is done in Fig 3.

Answer: the link path is identified by colored lines corresponding to the distance between the sensor and the 0°C isotherm (here taken at 4500m) in the satellite target *(for legibility reasons, only 2 paths have been drawn as examples)*

From Fig 5 and given the Y-axis ticks, deltaG seems to be at least 2.5 dB (> one graduation) while the values 1.85dB and 1.87dB are provided in the text.
The authors should verify ...

Answer: After verification, the values are 1.87dB and 1.89dB and have been calculated on the figure.

Regarding your response to my comment on „L350 and following "about the difference between Delta_G_p1 and Delta_G_p3: You write in your response that „there's no reason why delta_G should depend on the rainfall rate". But your results for Delta_G_p1 (obtain during clear sky) and Delta_G_p3 (obtained during heavy rain) show that there can be a difference of 0.9 dB for Delta_G, which might be relevant in the rainfall retrieval process. This could be caused by differences of the reported signal level (compared to the correct signal level) of the LNB for different magnitudes of received signal level, i.e. the LNB might report signal power at -32.0 dBm while the real received signal power is -32.5 dBm and it could report -28.0 dBm while the real value is -28.9 dBm (that might be a bit exaggerated). This effect could also be different for different frequencies. This could be checked in the lab. My gut feeling is that the used electronics should not be that bad. But, in the absence of any other explanation for the shown differences between Delta_G_p1 and Delta_G_p3 (or maybe I just missed it in the manuscript), this could be considered. Note that I do not suggest that the authors look into this now for the revision of the manuscript. My comment is just meant as I suggestion for an explanation of the observed differences in the Delta_G value

This paragraph explains the difference between the two procedure: "The difference between both procedures varies from 0.9dB to 0.2dB. Equation 12 assumes that T_N^A and T_N^B are equal and that the radiation produced by the sensor is negligible. Except that this assumption is wrong, and after a few experiments we estimate the difference between T_N^A and T_N^B (= Delta T_N) to be < 15K. Furthermore, it can be seen that when the brightness temperature T_A is very low, as in procedure 1, the channel-dependent brightness temperatures of the noise are no longer negligible. Whereas in procedures 2 and 3, T_A is high (>170 K) so the difference Delta T_N is negligible. We therefore use the value from procedure 3."

Fig 9: The y-axis should be equal on both subplots: Done