

Hydrol. Earth Syst. Sci. Discuss., referee comment RC1
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Comment on hess-2021-406

Anonymous Referee #1

Referee comment on "The influence of vegetation water dynamics on the ASCAT backscatter–incidence angle relationship in the Amazon" by Ashwini Petchiappan et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2021-406-RC1>, 2021

Review on "The influence of vegetation water dynamics on the ASCAT backscatter-incidence angle relationship in the Amazon" by Petchiappan et al.

This paper analyses the potential of radar data to monitor the seasonal cycle of vegetation and its water status for different biomes located in the Amazon basin using ASCAT C-band data. The paper is clear, well written and correctly organized. The results are interesting, physically sound in relation with the radar physics. My comments (see below) are really minor.

Abstract

Last line of the abstract, VOD is not mentioned before.

Introduction

L.24 much earlier reference exist on the sensitivity of microwave to the plant water content and status

L25-26: same remark

L.26: VOD is derived from passive microwave instrument

ASCAT data processing

Backscatter from the three beams are not acquired with the same azimuth angle while, azimuth effects can occurs depending on the canopy geometry. Could you elaborate on this ?

Figure 1: I don't see any mangrove on the LC map. Could perhaps be withdrawn from the legend ?

Results

Figure 4 à please use the same range of value for the y-axis to compare more easily the seasonal dynamics and the amplitude of the seasonal signal / provide the legend for fig 4a

Figure 5 same remark as for figure 4

Fig 7 (right) à please provide a different color for the ocean (dark blue is used both for ocean and fraction at the ASCAT pixel scale). White such as in Figure 8 would be fine.

3.1.1. Cerrado analysis: The observed lower backscatter values occurring simultaneously with the peak of the slope (i.e. flatter backscatter response with regards to incidence angle) is not straightforward to me. From what I understand, photosynthetic activity is occurring after the wet season because of the radiation increase and because of the capacity of the plant to extract water in the deeper soil layers explaining why the volume diffusion is higher at this time (flatter backscatter response as a function of incidence angle). Dry season is also associated to dry upper soil conditions leading to lower backscatter level along the whole range of incidence explaining why the average backscatter levels are observed during the dry season. Am I right ? If yes, the section could be slightly rewritten to make it clearer.

3.3. Drought of 2010 and 2015: why didn't the authors had a look to the impact of drought on the diurnal differences of backscatter ? Would it be possible to provide as supplementary material for instance, the time series of the diurnal differences for both drought years ?