This reviewer thanks the authors for efforts invested in the preparation of their manuscript. In this paper the authors overview an experimental set up where ground based GNSS receivers are used to passively monitor, primarily, vegetation water content or vegetation optical depth. The paper's topic has been the subject of some investigation in previous works in the relevant literature, but the authors discussion is extensive and offers a number of refreshing views on the topic. This reviewer does note a number of concerns outlined below, but would otherwise recommend accepting the manuscript after revision.

Comments

1. Refer to [page 1] "The technique presented here has the potential to resolve two important knowledge gaps, namely the lack of ground truth observations for satellite-based VOD" - This reviewer is a little reluctant to agree with this assertion. While it is true that VOD estimates derived from spaceborne observatories will require some level of ground truth, measurements derived from the proposed sensors will also require ground truth estimates in the calibration of measurements made and validation of subsequent VOD estimates. The authors are encouraged to revise this statement placing the proposed technique in the appropriate context or elaborate to this reviewer on why they feel that the sensors are in situ data, or ground truth data independent.

   It is also important to note that it is difficult for the proposed techniques to really compete with the main impetus for having spaceborne receivers, namely their global coverage versus the proposed highly localized estimates.

2. Refer to [page 2] "Microwave remote sensing methods are broadly categorized as either passive or active. Passive instruments (radiometers)" - The authors are encouraged to revise "Passive instruments (radiometers)" to something along the lines of Passive instruments (like radiometers). Any receiver that does not transmit its own signals or relies on signals transmitted by a none co-located system for sensing is by definition, passive. Radiometers are an example of passive instruments but a wide range of other platforms exist.

3. Refer to [page 3] "Higher VOD values indicate that the canopy is less transparent to microwaves" - The authors are encouraged to generalize this statement to all "impinging or reflected radiation" given that higher VOD also attenuates visible light and IR in larger proportions.

4. Refer to [page 3] "But can hardly be validated, as systematic ground-based VOD observations do not exist at the moment" - It is important to make clear that this is not indicative of an inherent limitation in the ability of spaceborne receivers to provide VOD estimates, just a lack of field campaigns; something that could change in the future and so this reviewer does not regard this as a reasonable example of why the proposed methodology is superior to approaches based on spaceborne receivers' measurements.

5. Refer to [page 9] "(which GNSS antennas are designed to reject)" - The authors are encouraged to make clear that it is ground based GNSS antennas that are designed to receiver RHCP. This is important given that spaceborne GNSS-R receivers typically have antennas that are designed to receive LHCP antennas given GPS signal reflection (and polarization handedness reversal) off the Earth's surface.

6. Refer to [page 11] "from 102 individual GNSS satellites" - This reviewer is only aware of there being 24-32 operational GPS satellites or so, did the authors also use reflections from other GNSS constellations like Galileo, GLONASS and BDS?

7. To make Figure 3(d) a little easier to follow, it may be useful to subject the series to a smooth (mean or median) smoothing filter in 15-1 hour increments. This may also aid in dampening the noise noted on page 14.

Once more this reviewer thanks the authors for efforts invested in the preparation of this manuscript and looks forward to their continued contribution.