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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Deriving surface soil moisture from reflected GNSS signal observations from a grassland site in southwestern France" *by* Sibo Zhang et al.

Anonymous Referee #2

Received and published: 27 November 2017

OVERVIEW

The manuscript investigates the use of the Global Navigation Satellite System Interferometric Reflectometry (GNSS-IR) technique for soil moisture retrieval. Specifically, one year of observations were acquired at a grassland site in France by using an antenna at 2 different heights (3.3 and 29.4 m). GNSS-IR data are compared with ground-based reference measurements and the effect of vegetation, litter water interception, sampling

interval and antenna height is analysed on the accuracy of the measurements.

GENERAL COMMENTS

GNSS-IR represents a new approach for measuring soil moisture and surely deserves to be investigated. Specifically, the potential of using GNSS-IR measurements for monitoring soil moisture over large areas might represent an important step forward in our capability of measuring soil moisture at field scale. The manuscript is well written and clear and, hence, I have no major comments to be addressed. I believe the paper might be published after considering the minor comment I reported below.

1) The same authors (nearly) published a paper in 2017 with a very similar purpose. I can see the differences between the two papers, and hence I believe this paper should be published. However, I strongly suggest to clearly underline the differences between the two papers and the main innovative aspects (e.g., antenna height, analysis of vegetation effect) of the current study.

2) In the description of the study area, more details should be provided. At which depth are installed the surface measurements? How many rain gauges are available in the study area? How many soil moisture stations (I guess one)? Which model is used for simulating soil moisture? I suggest adding all these details in the revised manuscript.

3) At Page 5, lines 17-20 it reads that only some satellite tracks are selected based on the comparison with in situ measurements. I was wondering how the authors will select the tracks if in situ soil moisture observations are not available, it should be clarified.

4) At Page 5, line 28, what is the "multipath interference pattern". Please clarify.

On this basis, I believe the paper deserves to be published only after a minor revision.

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