Hydrol. Earth Syst. Sci. Discuss., 9, C415–C418, 2012
www.hydrol-earth-syst-sci-discuss.net/9/C415/2012/

Hydrology and Earth System Sciences Discussions

Interactive comment on "The AACES field experiments: SMOS calibration and validation across the Murrumbidgee River catchment" *by* S. Peischl et al.

Anonymous Referee #2

Received and published: 19 March 2012

First I would like to acknowledge the authors and their team for the tremendous effort involved in setting up such an enormous experiment. I am convinced that the dataset will form the basis for several important publications. I can only agree with reviewer #1 regarding the usefulness of describing such an extensive campaign in a stand-alone publication. And indeed, the campaigns have enough ingredients to go beyond the validation of SMOS alone, e.g. by addressing scaling issues at various spatial and temporal levels. I have only a couple of minor issues and typographical and grammatical comments.

Minor issues

Although the main structure of the paper is already very clear, there is no a clear distinction between the paragraphs purely describing the study area, measurement setup, etc. and those where some results are presented. I would therefore recommend including a section (before Section 5) where some preliminary observational results are summarized. This can be done per campaign and between the campaigns, and include. observed differences in soil moisture and vegetation cover (P2767.L26ff), comparison with satellite-observed brightness temperatures etc. See below for some recommendations.

P2765.L20: It shall be mentioned that apart from the dedicated campaigns and validation sites also the International Soil Moisture Network (Dorigo et al., 2011a,b) is part of ESA's official platform for SMOS validation.

P2766.L22-25 (. . .analyses): These two sentences are redundant and can be removed.

P2767.L26ff: the description of observed soil moisture goes already into the interpretation of what has been encountered during the campaign. See my first comment to summarize the main observations in a separate section.

P2769.L11: Explain why these three incidence angles were used.

P2771.L4-21: This part could be moved to a "preliminary results" section.

P2772.L2-11: This part could be moved to a "preliminary results" section.

P2774.L15: What is the average time span temporary monitoring stations were installed at a specific location?

P2774.L21: How was skin T measured (which instrument, manufacturer, etc.)?

P2776.L15ff: this section needs some more detail and references, e.g: LICOR LAI-2000 (reference, number of repetitions, etc.), destructive measurements (how did you determine biomass / VWC (I reckon by oven drying for 24h?)), ASD (how many repetitions, using a white reference?), surface roughness (how was this measured (laser, pin

board)?)

Fig 4: For the interpretation it would be helpful to include the catchment boundaries (like in Fig 3).

Fig 5: This figure shows an example of SMOS L1C brightness temperature data which on itself are not very relevant for this manuscript but gain importance when directly compared with airborne data (like presented in Fig.4). I would therefore recommend integrating Fig 4. and 5 to enable a direct comparison between airborne and satellite data. Also this comparison can be presented in a "preliminary results" section.

Fig. 8: This plot is not really needed, as it just shows one example out of many. Besides, it raises some questions, i.e. why does the soil moisture content of the deeper layers in AACES-2 rise before precipitation takes place, and earlier than for the surface layers? I would therefore suggest removing this figure.

Fig 10: For which dates and location were the brightness temperatures calculated? Is it possible to add a similar plot for comparing simulated brightness temperatures with observed SMOS L1C brightness temperatures?

Type setting

P2764.L3: please state that it concerns SMOS product validation over land P2764.L1: Add http:// to URL. The same applies to P2778.L23

References:

Dorigo, W. A., Wagner, W., Hohensinn, R., Hahn, S., Paulik, C., Xaver, A., Gruber, A., Drusch, M., Mecklenburg, S., van Oevelen, P., Robock, A., and Jackson, T. (2011a). The International Soil Moisture Network: a data hosting facility for global in situ soil moisture measurements, Hydrol. Earth Syst. Sci., 15, 1675-1698, doi:10.5194/hess-15-1675-2011.

Dorigo, W., van Oevelen, P., Wagner, W., Drusch, M., Mecklenburg, S., Robock, A.,

Jackson, T. (2011b). A New International Network for in Situ Soil Moisture Data. Eos Transacations American Geophysical Union 92(17): 141-142.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 2763, 2012.