

Interactive comment on “Observing soil moisture temporal variability under fluctuating climatic conditions” by A. Longobardi

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I would like to thank the anonymous referee for contributing to the discussion and for acknowledging the importance of experimental studies as a way to add new evidences to the current state of the art. Commenting the experimental case study soil water dynamic, only two terms of the water balance have been mentioned: these are the infiltration and the evapotranspiration losses. The reason why no other processes have been considered to describe soil moisture profiles dynamic is that the latter are highly related to the climatic forcing, which impact was intended to be observed. Of course I agree that more terms, such as lateral redistribution and drainage, could be add to the water balance. Evidences of these processes have been indeed found in the experimental dataset, but I would also not consider their quantitative contribution relevant at this stage of the investigation. Quantitatively, the precipitation and its fluctuation seems

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to be the meteorological key factor. In fact, opposite to the rainfall regime, temperature variations among different years are not extremely significant: during the dry climatological seasons the variability is on average about 2% and it comes to 14% during the wet climatological seasons. The observed temperature regime is moreover similar to the mean regional temperature regime and the wetter than normal summer 2005 is, on average, only 5% warmer than normal. This would induce to believe that soil moisture variability is largely attributed to the precipitation variability.

Following are the answers to specific comments.

- Why is probe 1 selected for the plots in figures 5, 6, 7. Are Fig. 9 and 10 also for probe 1? Why not showing average conditions for all probes?

To shorten the results illustration only plots from probe 1 have been showed. Given the mentioned similarity between profiles from different probes, substantially similar in their climatic forcing induced dynamic and mainly differing for relative values, average conditions should confirm the illustrated patterns.

- How dependant does the author think the results are on soil textures? For example, on Fig. 8 one of the probes (6) shows a significantly larger drying than the others. Around October, however, probes 2 and 5 seem to dry much faster than the others.

Along a vertical section, for a given probe, similarity between surface or near surface profiles (10 and 30 cm) and deep profiles (50 and 80 cm) are evident. This similarity can be, in part, caused by soil texture classes but also, in part, caused by an inverse relative role of replenishment-depletion forces at different soil depths. Nevertheless, climate induced characteristics phases were evident at each level and since the aim was to observe the impact of fluctuating meteorological conditions on the soil system, soil texture effect was not discussed at this stage.

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