

General comments:

This is a well-written and well-organized paper of high scientific quality. This is an observational study aiming to explain the coupling mechanism between soil moisture and precipitation based on the long-time data with high temporal and spatial resolution.

The strength of this paper is the careful selection of the “un-organized” precipitation events occurring in the absence of strong, synoptic-scale atmospheric forcing. By doing so, the influence from land surface is isolated. The adoption of different statistical analysis and methods also makes the paper even more convincing.

There are only a few places requiring some further clarification. Please see below.

Specific comments:

1. Page 3210, Line 10 to 20: does this method for soil moisture conditions and anomalies only take into account the “local” temporal variability? What if the convective precipitation is caused by the spatial heterogeneity in surface fluxes linked with soil moisture? Does this method lead to smoothing of spatial variability? Is it possible that events with drier soil are from spatially relative wetter regions (compared with their neighboring regions) in a drier year, or vice versa?
This is also related to later arguments on Page 3217 Line 10 to 20, the preference of unorganized events over forest region and the interannual variability of the number of wet and dry events on Page 3218 Line 1 to 10.
2. In the decision tree of precipitation events, the minimum event size is 6km by 6km. The precipitation data are at 4km resolution. Then how is the event size determined? E.g. continuously adjacent data points?
3. Page 3213, Line 13, why 3 a.m. was chosen for the cut-off time? The average diurnal cycle of precipitation observed during warm season at ARM SGP site shows its primary peak around 3 a.m., which means there are significant portion of rain events passing by during the nighttime before 3 a.m.
4. Still related to 3 in above, what if there is precipitation accumulation less than 3 mm before 9 a.m.? How would you define your initiation time and location then? Will such data be used to relate with daily soil moisture at 9 a.m.?
5. How much perturbation will be observed in soil moisture roughly if there is 3mm accumulated precipitation?
6. Is there a precipitation rate limit, e.g. 0 or 3mm/hour, for you to determine precipitation initiation?
7. On Page 3223, Line 19 to 20. It is NOT the PBL growth that leads to shorter and smaller events. As you have shown on Page 3220 Line 10 to 25, the atmospheric moisture is also low over drier soil cases. It is indeed the atmospheric lower RH results in shorter and smaller events. PBL grows larger due to delayed cloud development with lower RH leading to higher lifting condensantion level (LCL).
8. Page 3208, Line 15: put “.” between “US” and “These”.