General comments

This paper presents the patterns and implications of diurnal variations in d-excess of plant water, shallow soil water and air moisture in Heihe River Basin, China. The analysis is conducted based on water samples taken in August 2009, June and September 2011 at five sites (S1-S5). Three species of plants (tree, shrub and grass) were selected to extract water from leaves, stems and roots. Overall, the paper is interesting and valuable for the understanding of the process of vegetation activity in controlling the dynamics of d-excess values in air moisture. Still, it could be even more valuable to the general public if the second objective of the article, i.e. "what are the mechanisms of the observed patterns?" would be further answered.

Throughout the paper, there are some iteration problems- especially concerning the discussion sections and the captions of tables and figures. Additionally, the authors often try to use defined location ID (e.g., S3 in P7L144), location ID with sampling time (e.g., S3-Aug in P11L234) and place names (e.g., the riparian forest site in P12L248) mixed together to represent the sampling locations, which prevent the reader from understanding the content. Therefore, I recommend a thorough review of language.

Specific comments

Keywrods

1. The keyword "deuterium" is same as "hydrogen" and "stable isotope". The keyword "water pools" is ambiguous.

Introduction

2. P5L93 "…affected by …".

Materials and Methods

3. P6L113-118 Does the temperature is lowest in January, and is highest in July in Dayekou and Ejin? How does the characteristics of rainfall over Dayekou? Why do you choose the sampling periods in June, August and September?
4. P6L119 Where did you get the number of 3700 mm? Calculated, cited or observed?

Please specify the reference? If the Ejin is the driest regions in China, I think a discussion on the applicability of this article's results on other climatic regions should be given.

5. P6L121, P7L23 "dominant" should be "dominated".
6. P7L125-128 Which species do the P.E., S.A. and R.S. belong to? Tree, shrub or grass?
7. P7L143 Which one does the S.C. represent, "Stipa capillata" or "Stipa capillata Linn" (P7L124)?
8. P8L149-152 The abbreviations of the name of sampled plants have been given in section 2.1. That's no necessary to use both the whole name and the abbreviations together to describe the plants. Same type of iteration also exist in P9L178-182. Please avoid this type of iteration.
9. P8L161 The citation "Wang and Yakir (2000)" is missed in the references section.

Results

10. P10L195 "composition" should be "compositions".
11. PllL224-226 I didn't find any plot represents "xylem water of S.C." in Fig. 3. Do you mean "xylem water of Q.S."? If so, could you please circle the range of "xylem water of Q.S." and "5 cm soil water" for easily distinguishing the difference between the isotopic compositions of these two water bodies?
12. P11L233-235 It is difficult to distinguish which figure represents S2 or S3 in Fig. 4. Please point it out clearly that which figure represents which sampling site?
13. P12L247-250, P12L252-254 Please describe the same sampling location in a consistent way within the article including figures and tables. It will benefit the readers to understand. Please use either defined location ID (e.g., S2), defined location ID with sampling time (e.g., S2-Jun) or place names (e.g., Gobi site).
14. P12L256-257 Does the temporal trends of d_{soil} at S3 was caused by rainfall? The soil samples were taken during two periods at S3, i.e. from 6:00 August 1 to 18:00 August 2 and from 6:00 to 18:00 August 3, 2009. Which day do you selected for analyzing the spatial and temporal variation of soil water d-excess at S3 in Fig.5? Same to other figures.

15. P13L271-272 How much significantly do the d_{leaf} values during the cloudy days higher than those of the sunny days, and the d_{leaf} values lower than d_{xylem} values during the cloudy days? Were the d_{leaf} values lower than d_{xylem} values in all the sampling site during the cloudy days or just in some site? As shown in Fig.7a, the range of d_{leaf} values are not so much different from the range of d_{xylem} values.
16. P13L274-277 Please use consistent expression for time format (h:mm am or h:mm).
17. P14L283 The phrases of "significantly positive/negative correlations" and "significantly positive/negative relationships" appear many times in the article. Could you please elaborate how do you judge the "significantly correlations" or the "significantly relationships"? Which statistical parameters do you selected to use, and what's the threshold value to judge the relationship is significant or not?
18. P14L295-297 What does the "overall values" mean? Does the "overall values" mean $d_{moisture}$/RH at all the sites? I find the slope of $d_{mositure}$ versus RH near the ground in the forest is "-0.36" in Table 6, but not "0.36" as stated by the authors. Besides, no $d_{mositure}$/RH value at S5 was found in Table 6. Then, how to estimate whether the $d_{mositure}$/RH value is high or low at S5?
19. P14L297-298 The coefficients of d_{soil}/RH range from -0.046 to -0.483, at site S1-Jun, S1-Sep and S3. It seems no significant relationship between d_{soil} and RH at these three sites.
20. P14L301-302 The authors mentioned "Significantly negative relationships were found between d_{leaf} and T … in the upper reaches." Does the same relationship also exist in the down reaches?
21. P15L312-314 What does the "overall values" mean here?

Discussion

22. P16L336-342 I think may be it is better to move this paragraph to the introduction section. "fingerprint" or "footprint"?
23. P19L407-410 Grammar mistakes.
24. P19L410-413 The authors state that "…d-excess of moisture through soil evaporation also has an important role on changing the $d_{moisture}$ of local air

moisture during the sunny day after the rain events, …" Could you explain from which paragraph or figure you get this result? How does the soil evaporation affect the $d_{moisture}$ of local air moisture? Please specify what "the meteorological conditions" mean? Temperature? Moisture? Or rainfall? If it is possible, please discuss which meteorological condition play a more important role?

25. P19L417-418 Why the observed values in this study higher than that of previous reports? The authors should explain why and expand on the implication of this phenomenon.
26. P20L432-434 I didn't find the diurnal variation for $d_{moisutre}$ near ground at S1-Jun is clear in Fig. 8b. Besides, the variation tendency of $d_{moisture}$ in other sub-figures of Fig.8 seems also agree with the variation tendency of d_{leaf} at corresponding sites shown in Fig.7, although the tendency is not very clear. If so, please elaborate the implication of this phenomenon.
27. P20L437-P21L442 This information has already been given on Page 14 Line 283-289. Please check other iterations in the discussion section.
28. P21L449-451 The authors state "… the water evaporation of soil surface may play a similar role to leaf transpiration as an important source to affect the isotopic composition of atmospheric vapor." Pleas elaborate how did you get the result from the relationship between d_{soil} and RH/T?
29. P21L456-460 As shown in Table 5, the correlation coefficient for d_{soil} and RH at S3 is 0.289 at 5cm, 0.255 at 10 cm, respectively. It seems no significantly positive relationships between d_{soil} and RH at S3.
30. P22L488 The authors state "…high significantly relationships between $d_{moisture}$ with RH/T are found…". Please clarify which statistic parameter indicate the high significantly relationships.

Conclusions

31. P23 L505 Please point out which previous observations and what theoretical predication? Also, the authors should discuss and conclude why the peak-through amplitude of d-excess values observed in this study is higher than previous studies.

Tables and Figures

32. Table 3 Please try to shorten the captions of all the tables and figures, and avoid iteration in the captions of tables and figures. Does the “Sophora alopecuroides L.” in the caption of Table 3 is same as “Sophora alopecuroides” in P7L126?
33. Table 6 The authors state “m, b and r” would be used to represent “slope, intercept and correlation coefficient” in the caption of Table 6. However, “m, b, and r” were not appeared in the Table 6.
34. Figure 1. What does the filled stars represent in Fig.1? Please add the legend. Please label the study area and the country’s name in the bottom right corner of the map.
35. Figure2. I think it will easier to understand the article to add the sampling date in the title of horizontal axis.
36. Figure 3 The citation “He (2011)” in the caption is missed in the references section. “water pool” should be “water pools”.
37. Figure 5 No sub-figure 5f was found. Please check.
38. Figure 9 What do the “AC” and “NG” represent to in Fig. 9?