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Interactive comment on "Response of water vapour D-excess to land-atmosphere interactions in a semi-arid environment" *by* S. D. Parkes et al.

Anonymous Referee #1

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General comments:

The study "Response of water vapour D-excess to land-atmosphere interactions in a semi-arid environment" by Parkes et al. analylses the interplay beteween changes in atmospheric moisture isotopic compositions and the impact of local scale forcing of evapotranspirative vapor isotopes. As recently the isotopic composition of atmospheric moisture has been proposed as a tracer of large scale moisture recycling, this is an interesting topic. Also, apparantly the impact of isotopic compositions was often studied using modeling approaches, which is rather surprising to me, given the increasing amount of isotopic ET studies recently! The overall quality of the paper notwithstanding, I see quite some space for improvement both technical and content related. 1) In my opinion the study campaign was rather short, only 2 weeks roughly, and to my mind the significance of the interpretation is hence limited. 2) I have some

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methodolical concerns regarding laser spec calibration and chamber construction (see detailed comments). 3) To my mind both results and discussion section are rather long and very detailed. Moreover, quite often results are repeated within the interpretation section, making the manuscript rather hard to follow at that point (very unlike the intro and M&M part btw.). I suggest to focus on the main results and shorten both parts to make it easier to follow.

specific comments:

48ff: Be more specific! How?

60ff: I think this is a bit overstated, there are surely some examples here!

63ff: Shouldnt this be 2 sentences?

73ff: how about transport processes? i.e. kinetic fractionation?

81ff: Again, doubt there are so few. How about Berkelheimer, Simonin, Welp and others?

98: Suggest to change "given this" to therefore

140: have has? omit has?

168: I f you indeed did not calibrate or drift check the LGR i think your values have a high uncertainty. I.e. the average difference to the Picarro might be small but you standard deviation suggests there was a high point to point difference. At the least it would be nice here to see the time evolution of the difference between laser specs throughout the campaign!

207: Strong doubts concerning you placement of collars only 2 days prior to measurements! this will surely cut roots and there will be some affects in that direction

211: Did you coat the chamber in some ay? It is well known that Plexi exchanges water and acts like a sponge creating a smearing effect in background chamber and

vice versa transitions. This could actually affect you keeling plots quite much.

230ff: Why did you choose the Keeling method? Why not a mass balance approach?

256: Did you not measure soil water isotopes directly ? What is the uncertainty of the model approach?

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