We appreciate Anonymous Referee #1's thoughtful comments on our manuscript. Below we respond (in bold type) to the referee's specific comments (in normal type).

The manuscript presents a thorough study of the daily cycles of different hydrological variables during rainless periods in different seasons, reflecting diurnal extraction of shallow groundwater by evapotranspiration and diurnal additions of meltwater during snowmelt. Basis of the study is extensive dataset of diurnal cycles of stream water level, groundwater levels, sap flow measurements, snow characteristics (snow water equivalent) and several other hydrometeorological conditions in the studied catchments (two snow-dominated headwater catchments in California's Sierra Nevada mountains). In the introduction section authors clearly present the basis of the topic. They explain two contrasting concepts, namely, the water table fluctuations (WTF) and missing streamflow approach, which have been traditionally used for analysis of the observed daily cycles. Furthermore, the question of time lags between the daily minimum and maximum ET and snowmelt rates vs. daily stream discharge and groundwater levels cycles is thoroughly explained and gives a reader (even those without strong theoretical background) good insight into the discussed topic.

The manuscript is long; however, I see no other option to present the discussed topic in a such holistic way. Namely, the authors have successfully covered different aspects of the research: (1) extensive field measurements; (2) theoretical background upgraded by a simple, but innovative conceptual model of the riparian groundwater mass balance and (3) presentation of the remote sensing data to support the concept. All 3 parts combined give excellent and holistic picture of the discussed topic.

By using stream levels data directly, authors presented a way how the problem of rating curve uncertainty can be avoided in analysis of daily cycles of various hydrological variables which are usually obtained through different hydrological measurements. This can be problematic especially in the range of extreme values (in this case during low-flow conditions).

In my view, the paper suits well in aims and scope of the HESS journal and I strongly support the publication of the manuscript. I would like to congratulate the authors for their excellent work. Bellow I provide some specific comments which are more or less technical.

We thank the referee for these supportive comments. We understand that the paper is long but, like the reviewer, we think it makes sense to present the whole analysis in one place.

Specific comments: Line 45:

Maybe the role of specific sub-catchment characteristics (the low-land part of the catchment becomes ET dominated before the headwater (high-land part) could be more directly highlighted in the abstract. In the transition period, the temporal prevalence of snowmelt over the ET and vice-versa, strongly depend on the local topography characteristics. This aspect is thoroughly discussed in the manuscript.

We will change the sentence, "Streamflow, however, integrates these transitions over the drainage network" to say instead, "Melt-out, and the corresponding shift in the diel cycle index, occur earlier at lower altitudes and on south-facing slopes, and streamflow integrates these transitions over the drainage network."

Line 144: I suggest changing the sentence: …making these basins, in terms of climate characteristics, ideal…

We will change this to more clearly express the link that needs to be made: "making it relatively easy to see how snowmelt and evapotranspiration are reflected in daily cycles in groundwater and streamflow."

Line 235: If I understand correctly, the “absolute” sap flow values were not directly used (the sap flow instruments were not calibrated) since the temporal changes (daily cycles) of sap flow were used in the study. Could lack of the calibration (drift) also influence the timing of the sap flow daily cycle?

Your understanding is correct. Changes in calibration (mostly due to wound healing in the trees) should affect the amplitude of the observed signals but should not introduce a measurable phase lag.

Line 271: The reported data gaps occurred during the observed 3 years?

Yes, in some cases. Some of the stage recorders had frequent failures, and since they were typically downloaded only a few times per year, the resulting data gaps are sometimes quite long. The results that are shown in the paper are obtained from the sites and time intervals without substantial data gaps.

Line 279: Could the elevation bands limits centered on SNOTEL stations be also shown in Fig. 1 for illustration purposes?

Yes, but this would tend to make it harder for readers to see other essential information in the figure. We will instead prepare a supplementary figure that shows these elevation bands, along with contour lines (some readers find that contour lines are easier to interpret than grayshade, or the other way around).

Figure 6: Groundwater levels shown are absolute values? I would suggest slightly changing the Fig. 6 caption sentence (line 1060): …averaged roughly 200, 1050, 1080, and 950 mm above the Sagehen Creek water level…

We will change the caption to make it clear that the quoted average elevations are above the water level in Sagehen Creek.

Line 369: Is this correct? What could be an explanation for a “static water level of 0.6m above the ground surface”?

Yes, this is correct. The explanation comes a few lines later: "These measurements also demonstrate an upward hydraulic gradient in the valley axis at all three locations, consistent with our hypothesis of groundwater flow from upslope recharging the riparian aquifer during mid-summer, thus sustaining both streamflow and plant water use." We will modify this statement so that it is clearer that by "groundwater flow" we mean bedrock fracture flow.

Lines 405-408: Could authors support their statement with measurements shown in Figs. 3 and 4? This would enable readers to understand the underlying processes more easily.

We will add the statement: "One can see this behavior in Figs. 3 and 4: groundwater levels change fastest near the peak of the solar flux (Figs. 3a and 4a), but the groundwater levels themselves reach their maxima (or, for ET cycles, minima) several hours later (Figs. 3c and 4c), when the rate of groundwater rise or fall changes sign."

Line 422: What kind of water level? Groundwater, streamflow or some kind of “general water level” as an indicator of hydrological state of the catchment?

Sorry, we mean riparian groundwater levels and will modify the text accordingly.

Line 435: What is “A” in the combined forcing $P + M + G – E = A\cos(wt)$?

A is the amplitude of the assumed sinusoidal forcing. We will add this to the text.

Line 515: Were the average lag times for the two stations assessed from low flow discharge conditions (where the diel signal is evident) or using wider range of discharge conditions?

The calculations behind the statement in line 515 were made under average discharge conditions, but the results are not sensitive to the flow regime that is used. The cross-correlation results presented in line 510 are for all three years of data combined.

Figure 9c (lower plot): If the cloudy days and rainy periods were excluded form the dataset, how can detrended stage fluctuations data be continuous (or are they only seemingly continuous)?

Cloudy and rainy days were not excluded from the data set, but rather from the daily correlation analysis shown in Figs. 9a and 9b. That is why blue dots (indicating diel cycle index values) are missing for some of the days in Fig. 9c (and also for some days in Figs. 11, 12, 14, S3, and S4).

Lines 600-601: Since DEMs from Lidar data are available for studied catchments, could authors make their statement more tangible (quantifiable) in terms of the approx. % of slopes (catchment) facing north/south direction?

It is difficult to reliably estimate the catchment area that drains to the two well transects (since they are aligned roughly perpendicular to the stream, and thus parallel to the groundwater flowpath). Nonetheless, at the B transect the stream flows almost exactly from west to east. Thus almost all of the terrain north of the stream faces south, and almost all of the terrain faces north.

Lines 841-843: I would suggest mentioning also the problem related to the fact that diurnal cycles in stream water level in larger catchment (especially during the ET dominated periods) is pretty much undetectable (or unrecognizable) by the waters stage measuring equipment. Of course, this could be related to various lag times to the gauging stations as mentioned by the authors.

We are reluctant to say this because we present no evidence indicating that diurnal cycles are actually undetectable in larger catchments. It seems reasonable that this may be the case, but we would not want to assume it.