**Title:** Coupling between downstream variations of channel width and local pool-riffle bed topography

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In this paper, the authors study how established pool-riffle sequences respond to time-varying shifts in the channel width. For this, the authors conducted flume experiment with prescribed changes of channel width, and also applied a broad set of field, experimental, and numerical data from literatures. Their results show that local bed slope is inversely correlated with the spatial gradient of channel width, which could be well predicted by a scaling theory. The topic of this manuscript is of interest to the readers of Esurf. However, clarifications are still needed at several places in the methodology and results sections. I suggest that moderate revisions are needed before the manuscript can be accepted.

**Main comments**

1. In both the Abstract and the Introduction, you mentioned that the response of pool-riffle sequences to time-varying channel width is not well understood and thus is the object of this study. In the following sections of the manuscript, you showed the bed topography under two phases of channel width conditions. However, for both phases, the results you showed are for quasi-steady state. I agree that it is very good (and is a step forward) to learn the new steady state of pool-riffle system when the channel width varies. But to me, the quality of the manuscript would be greatly improved if the results of the transient process can also be presented (so that readers can know how the channel adjusts dynamically after the shift of channel width). For this, you can show the results between elapsed time 960 min and 1752 min during your experiment (if you have done the measurements).

2. In Figure 3, you showed the calculational results of Equation 1 (as you explained in the caption). However, Equation 1 is actually not an equation, as there is no equal sign in it. How did you conduct the calculation?

3. In Lines 183-186 and 254-258, you discussed the correlation between $\Delta w(x)$ and $S_{local}$. More specifically, when $\Delta w(x)$ and $S_{local}$ have the same sign (both positive or both negative), you say they are direct correlated, otherwise you say they are inverse correlated.
However, by definition the correlation coefficient is calculated as $Cov$ (X, Y)/($\sigma_X \sigma_Y$), with $Cov$ (X, Y) being covariance of $X$ and $Y$, and $\sigma_X$ ($\sigma_Y$) being the standard deviation of $X$ ($Y$). In this case, direct (positive) correlation means that large values of one variable are associated with large values of the other and small with small (with a correlation coefficient between 0 and 1); inverse (negative) correlation means that large

values of one variable are associated with small values of the other and small with large (with a correlation coefficient between 0 and -1).

Therefore, I cannot understand how do you determine the correlation between $\Delta w$(x) and $S_{local}$ using only one data point (i.e. one value of $\Delta w$(x) and one value of $S_{local}$)? Or do you mean the correlation between channel width $w$ and bed elevation $z_b$? (As you can tell whether $w$ increases or decreases with the sign of $\Delta w$(x). The same is true for $z_b$ and $S_{local}$.)

**Specific comments**

1. L49-56: This paragraph should belong to the Conclusions, not the Introduction.

2. Figure 1: In the legend of the left panel, what do you mean by the "topographic profile", bed elevation or bed slope?

3. L77: What does $L_c$ denote? Please explain.

4. L81: $\Delta q_{bx}^{*}$ is not defined in the manuscript.

5. L81-83: What is the basis for these assumptions? Please clarify.

6. Caption of Figure 3: In the fourth line, it says "Result from ? comparable PRE4…". Is there a typo?

7. Caption of Figure 3: In the 7$^{th}$-9$^{th}$ line, the symbols are not consistent with those used in the plot. Please note the direction of the triangles.

8. L168: Do you mean $\Delta w$(x), rather than $\Delta$(x)?

9. L308 and 310: Do you mean Figures A1-A5 and Tables A1-A5?

10. Figure A3: How do you specify the four locations of open circles in this case? Any criteria? From the plot of bed elevation, it seems that you are not choosing the locations of pools or riffles.