

**Review of: The water temperature characteristics of the Lena River at basin outlet in the summer period. Paper # hess-2016-254**

Response to Authors: Vera Fofonova, Igor Zhilyaev, Marina Kraineva, Dina Iakshina, Nikita Tananaev, Nina Volkova, and Karen H. Wiltshire

The basic problems with this paper remain. It still contains the kind of grammatical errors that were rife in the original. It does not sufficiently describe or explain critical issues:

- ‘wall function’ – While the term is familiar to many, T.J. Craft of the Manchester School of Mechanical Aerospace and Civil Engineering mentions fourteen different approaches in an article on Wikipedia. For purposes of doing an adequate review, as well as for the general readership of HESS, a specific reference (there are three in the paper) and an equation are necessary. This particularly important since it appears that the wall function the authors chose, provides the basis for the simple model embodied in Eq. 1-3.
- ‘bootstrapping’ (generally spelled with two p’s, as in ‘bootstrapping’) –A generic statistical technique, as described in Wikipedia article: “In [statistics](#), **bootstrapping** can refer to any test or metric that relies on [random sampling with replacement](#)”. The reference provided in the paper links to a lecture comparing the results from using aspirin compared to using a placebo. If this is an important element in the paper (it’s not clear that it is) an explanation is in order.
- ‘optimization’ – There is a gesture in the direction of an explanation of this in the revised manuscript, but it’s one that really doesn’t provide enough detail for the reviewer or general readership. Furthermore, its application is highly questionable as a method for forcing the model to replicate the observations. In this regard, it is hard to believe that the high frequencies in the hydrographs resulting from the ‘optimization’, as shown in Figures 10 and 11, bear a relationship to reality in the Lena River system. When solving an inverse geophysical problem in a highly underdetermined problem, as this is, an exercise of this kind reveals little about the actual behavior of the system.
- ‘quality assurance and experimental design’ – Making sense of the long record at the Kusus gaging station is a worthy goal. The challenges associated with the location of the temperature monitoring site and the measurement method make it important that there be a well-designed experimental design. For purposes of evaluating the previous record, one made with questionable measurement methods, some effort should be made to characterize the uncertainty of the observations.

Finally, after 16 pages, the authors can only conclude, (1) “The difference in the behaviour of stream temperatures at Habarova GS (*sic*) and Kusur and non-representativeness of the measurements at Kusur GS (*sic*) for the whole cross-section indicate that the measurements at Kusur GS (*sic*) should be taken for analysis of water temperature changes in the delta head area with a great caution”, and, (2) “There are indications in favour of an unaccounted source of heat in the late summer/beginning of fall from the riverbed to the water in the area of the delta head. More analysis and observations are required to make further statements in this direction”.

It is difficult to see how this paper in its present form significantly increases our knowledge of the dynamics of stream temperature in the Lena River system.