The present authors' comment, referring to the discussion paper with the title "3-D-numerical approach to simulate an avalanche impact into a reservoir" (doi: 10.5194/nhessd-3-4121-2015), is aimed at comment of the **anonymous referee #2** (C1837), published on 28 September 2015.

The authors want to thank the referee for her/his very detailed comments and especially for the suggested grammatical corrections, which are now fully integrated into the revised version of the paper. We highly appreciate all the remarks, which are very valuable for the actual paper and help us to improve further research in this field.

Specific comments:

The answer to the first comment on the "black box" is included into the reply to the anonymous referee #1. The authors allow to refer for the answer to this author's comment. The reduction of the thickness s is now highlighted in the manuscript and the investigation of the influence is included in the step 6 of the modelling concept.

For the calculation, we used a **slide impact velocity** of 40.4 ms-1 (Table 1), which was evaluated at the front of the water avalanche in dependence on the control section, which is used for the calibration of the water model. We used the average front speed for the last time step before the avalanche reaches the water surface of the reservoir (variation between 38.9 ms-1 to 41.6 ms-1). The referee is absolutely right, that Heller et al. (2009) use the slide centroid impact velocity for the calculation. We clarify this in the paper, but we didn't want to show a detailed investigation on this topic, so that the paper is not extended too much. In general, to evaluate this slide centroid impact velocity without the assumption of the use of the slide velocity near the impact, the water body has to be exported as an stl-file and evaluated in a CAD-software. With this information, the velocity in this point can be evaluated. In the presented simplified case, no restart is used. Thus, the movement of the complete water body is more effected by the initial conditions, than it would be in a real case. As a first assumption we used the velocity at the control section and for further research this topic should also be considered. Especially if real data of an adequate scale model test is used, this assumption should be reviewed. Thank you for this suggestion. We will keep this in mind.

Yes, Figure 6 is very packed. We added an additional tabular with the input parameter and the results (overtopping volume and run-up height), which was recommended by both referees. This should help to see how the variation of the parameter was conducted. For the interpretation, the authors included two new figures, which contain specific results of the complete variation. For the new Fig. 6 the freeboard is fixed and the still water depth is changed.

The authors added an additional explanation of the 3-D- option, which allows to simulate a radial wave propagation. This should give the idea of this concept and for further detailed information it can be referred to Heller et al. (2009).

Technical corrections:

The referee #2 suggests to include the words "impulse wave" into the title. With the change of the title we hope to fulfil this suggestion. We also added the main conclusion as well as the remark on the needed further research. We hope to meet the demands and that this change is possible for the final paper, which hopefully can be published in NHESS.

European is deleted and furthermore all smaller changes are executed without a special remark in this comment. We also checked and corrected the definition of the three phases of the impulse wave as given by Zweifel (2004).

The order of more than one reference in the paper are always alphabetical. The referee #2 suggests to change this to a chronological order. We could not find a defined regulation of the journal and hence we would like to ask the editor, which variation should be implemented.

The sentence with the water depth of the water body at the beginning of the simulation is corrected and added to the first sentence in this paragraph.

To highlight the difference between x (value of distance, depending on the impact point of the avalanche) and x"tilde" (depending on the local coordinate system, which is fixed) , we added the x"tilde" in the Figure 2 and additional remarks in the text. We hope that this can clarify the difference and the need of different values.

We added the used bulk slide density by Fritz et al (2003b) which was indeed higher. The comparison is intended to be rather a qualitative one to make sure, that the inflowing water nearly behaves as the gravel in the experiment and not for example flows over the still water body. Zweifel (2004) would have used a more suitable density (depending on the investigated case of a water avalanche) of around 1000 kg m^-3, but he focused more on the wave propagation and not on the impact in detail. As mentioned before, further investigation in this direction should be part of future research.

The detailed definition of the used control profile is necessary to clarify the time, which is further mentioned. The authors rewrote the introduction of this sentence. We also clarified the definition of t=0s for Figure 5 in the text. In Table 1 the unit of the bulk slide density was wrong. We corrected it.

The referee is surprised about the strange numbers in Fig. 3 and 4. This is a general mannerism of the software FLOW-3D. We corrected the numbers of the axis manually and also added the x^tilde into the Fig. 2 to highlight the difference between the local coordinate system of the numerical simulation (chosen and fixed) and the parameter x, for which the starting point is depending on the different still water depth h (Sec. 3.3).

Subfigures (a) to (l) are added to Fig. 3. The time t=0 s in this particular case is chosen as the starting point of the simulation. We clarified this in the caption. In case of the additional comment corresponding on the unit, we believe that the caption is correct. The used unit [ms-1] refers to the colour, which indicates the velocity magnitude (a-f) and for the right column (g-l) the velocity in x-direction. The direction of the actual flow is shown with the vectors.

Overtopping is used in all figures.

<u>Suggested grammatical correction:</u>
All suggested grammatical corrections are implemented into the actual version of the paper. The authors also corrected the word "outflow" with "overtopping" volume as recommended.

All in all, we hope that we could improve the paper significantly and that the referee can approve of all changes. Thank you for your work and the time you put into the correction.