Dear Wolfgang Schwanghart,

We are very grateful that our article has been accepted and have taken into account all comments listed.

Below is a point by point answer to those comments:

Reviewer 1 "[…] final time to check for spelling errors etc. (e.g., spaces before periods, e.g. lines 85 and 749; caption Fig. 12 ('the variation uplift rate'))". *Corrected*

Veerle Vanacker comments:

L85: Is the term "reconstruction" adequate here? *Changed to "reworked"*

L87: The authors might want to check wording. *The sentence has been reworked into "Defining system characteristics and boundaries is important, as depending on the observation scale the accumulation in one system can be either absolute (i.e., where the regolith column is enriched by external sources) or relative (i.e., where the regolith column is solely enriched by the underlying bedrock)(McFarlane, 1983; Goudie, 1985; Tardy, 1993)"*

L187: P is not defined here, would be helpful to have it defined on L187. *P is now defined on L187*

L267: The authors might want to check wording -/ "three other differential equations". *The wording has been corrected into "four different differential equations"*

Figure 6: Just wondering, but in this setting with percolation being the dominant factor for duricrust formation, and homogeneous precipitation over the entire slope, wouldn't one expect that the hardening is dependent on the depth below the surface (related to the depth of percolation)? Why is the duricrust formation so dependent on the height above the water table? Is this because of capillary rise, and how realistic is it to have capillary rise over several 10m depth ?

This is a very interesting point. You are right in that hardening could have been dependent on the depth related to percolation, however percolation as such is difficult to parametrize and we wanted to stay as simple as possible by only defining a homogenous regolith layer divided in either saturated and unsaturated zones. The duricrust, depending on the mode (percolation in this case), form mostly at the surface as we approximated leaching and mass loss into the mass loss time scale which evolves vertically through the profile, being more intense in the upper parts of the regolith.

For capillary rise, realistically speaking, it would not affect the whole profile in the unsaturated zone, so this component is not the main parameter driving the model.

L455: check for typo. *Corrected*

L479: check for typo. *Corrected*

L480: writing the time intervals as multiplications of 10 is easier to read.

L710: check writing. *Corrected*

L721: check wording. *Corrected*

L739-741: sentence is not entirely clear. What is meant here with sedimentation? *We reworked the sentence to make it clearer. The mentioned sedimentation is the produce of erosion from the higher topographic elevations. During the evolution of the profile, we can see through the ages and the accomodation to the base level, that there is more material at the top of the duricrust. It is also what we can observe in figure S19, where the hardening column 2 starts at the surface, but then you can see that it is shifted below, being buried by new material on top.*

Reworked sentence: "In contrast, no such discontinuity in duricrust age between the buried duricrust and the underlying regolith is predicted, but sediments on top of the LAT duricrust have ages that progressively young towards the surface. At the end of the model experiment, the duricrust formed by WTF caps the hill, the other, formed by LAT, is buried beneath several tens of metres of material. The overlying sediments were deposited from higher elevations, i.e. the top of the hill, during the evolution of the topography and formation of the duricrust."

We hope to have answered all questions. We also went over the manuscript as suggested to check for typos, spelling, wording and punctuation.

Thank you again for your review and acceptance of the manuscript.