

## **Response to Cornelius Fischer referee comments on “Impact of grain size and rock composition on simulated rock weathering” by Yoni Israeli and Simon Emmanuel**

We thank Cornelius Fischer for his helpful and constructive review. Responses to the comments are provided below, in underlined italics.

**RC 2.1:** As the authors already state in the manuscript, the reacting grains or domains do not show any internal heterogeneity such as defect structures etc. The contrast in defect density would add additional constraints to the evolution of material flux from the reacting surface [1].

**AR 2.1:** *We agree that both intra-granular and inter-granular heterogeneity have the potential to affect both reaction rates and dissolution patterns. In the revised manuscript this is discussed on page 7 lines 24-27 and represents a promising direction for future research.*

**RC 2.2:** Additionally to the thought about contrasting defect density mentioned above, one could additionally think about interpretations that highlight contrasting and preferred crystal orientation, implemented by the presented approach of several domains. In that sense, the geometric approach highlighted in this manuscript offers potential for multiple applications in the weathering community.

**AR 2.2:** *We thank the reviewer for pointing out this implication, and we discuss it in the revised manuscript page 7, lines 28-32, page 8 lines 1-2.*