

***Interactive comment on “Rolling stones; fast weathering of olivine in shallow seas for cost-effective CO<sub>2</sub> capture and mitigation of global warming and ocean acidification” by R. D. Schuiling and P. L. de Boer***

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This is a very well written, timely and convincing manuscript that should definitely be published. There is no question in my mind that society will need to apply geo- or climate-engineering options, to counteract rising CO<sub>2</sub> emissions, sooner rather than later. What is more suited than to follow the natural cycle documented in Earth History but at anthropogenic speed? Fast carbon perturbations can be counteracted by accelerated weathering of natural rock (it should be noted that many proposed options only address global warming and climate change but not ocean acidification). Schuiling and

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de Boer demonstrate, by a simple experiment and based on first principles, that the job can be done.

Although the manuscript could be published as it is, I do have some comments that could be addressed in the final manuscript:

p. 554, line 10: “We estimate that present-day CO<sub>2</sub> emissions are around 30 times larger than the natural emissions from volcanoes and limestone dissociation combined.” This needs a reference or explanation how they arrive to that number.

p. 554, line 15: The comma needs to be removed in the equation after the arrow and before 2 (Mg, Fe)<sub>2+</sub>

p. 556: “4.1 Application”: Olivine is heavier than quartz. . . . The question I have is whether wave action will “bury” the olivine and limit its weathering? This would require a field experiment (and up-scaling). Although this is not the issue of this paper, it may have an important impact on the effectiveness of the process.

p. 558: lines 6-8: The costs of transport and spreading (6-7€ per ton) come out of the blue. . . is there a reference?

The bottom line is that I highly recommend this manuscript for publication.

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