Dear Referee:

Thank you very much for your time and comments. Your suggestions are appreciated and helpful to improve the manuscript. Below are our replies to the individual questions.

(1) Please add to the Abstract: which exactly classes of aggregates have been obtained; quantity information; reduce the introduction part.

Answer: The relevant part in the Abstract will be changed to: “Both the eroded sediments and undisturbed soils were fractionated into six different size classes using a settling tube apparatus according to their settling velocities: > 250, 125 to 250, 63 to 125, 32 to 63, and < 32 µm.” The current “Introduction” is necessary to clarify all the relevant background information in the most concise manner, and therefore cannot be reduced any shorter.

(2) L90 Please clarify the depth of the A horizon.

Answer: L1 on page 8833 in revised manuscript will read as: “A-horizon material (top 20 cm) was sampled from a gentle shoulder slope (< 5%) in March 2012.”

(3) L128 Remove “but” in the start of the sentence.

Answer: “But” is removed.

(4) L191 How long the incubation was done?

Answer: The fractionated sediments were re-wetted on the previous day, approx. 20 hours before conducting the respiration measurements, to exclude the initial CO2 pulses possibly caused by the rewetting effects (Orchard and Cook, 1983). In this study, the respiration measurements were only carried out for once, mainly to determine the instantaneous respiration rates. This can effectively mimic the natural processes, where dry sediments deposited from previous rainfall events experience a second time of erosion and transport processes. However, instantaneous respiration can only partly reflect the long-term respiration potential of the eroded SOC. Further investigation on the quality of eroded SOC is required to determine the fate of eroded SOC.

(5) L345-350 Please, split the sentence.

Answer: The sentences will be changed in revised as: “As a consequence, the preferentially deposited SOC could potentially generate a further error in the carbon source-sink balance. Such error would be particularly significant, when repeated erosion and deposition processes along hill-slopes cause further disintegration of large aggregates (Kuhn et al., 2003; van Hemelryck et al., 2010). This would thereby result in additional SOC exposure and mineralization (Jacinthe et al., 2002; Six et al., 2002).”

(6) Table 1. Term “concentration” is usually used for the solutions, for the solid substances term content has to be used. The dimension mg g-1 soil is not so typical, better to use g kg-1 soil. “General SOC” what does this mean? I suggest to leave SOC here, and in case of SOC in aggregates write in the left column SOC (g kg-1 fraction). Please, present the standard errors by the normal way (_value).

Answer: The text body and Table 1 in Method will be modified accordingly to:

“A-horizon material (top 20 cm) was sampled from a gentle shoulder slope (< 5%) in

March 2012. Previous research on the same silty loam showed that aggregation increased the settling velocity of original soil fractions, particularly the medium sized fractions, in comparison with that expected based on the texture of the original soil (Hu et al., 2013b). The mineral particle specific SOC distribution, average SOC content (LECO RC 612 at 550°C), and aggregate stability of original soil (method adapted from Nimmo and Perkins, 2002), are shown in Table 1. The mineral particle size distribution was fractionated by wet-sieving, after dispersed by ultrasound using a Sonifier Model 250 from Branson, USA. The energy dissipated in the water/soil suspension was 60 $J \cdot ml^{-1}$ (i.e. Energy = output power 70 W × time 85 s / suspension volume 100 ml). The SOC mass proportions across mineral particle size classes were calculated only from average values of individual weight and SOC content. Although the ultrasound energy used in Hu et al. (2013b) was not enough to thoroughly disperse the original soil into real mineral particles (Kaiser et al., 2012), such extent of dispersion was notable enough to demonstrate the potential under-estimation of applying mineral particle size distribution to predict the settling velocity of eroded SOC. Hence, it is speculated that similar increasing effects would also occur to sediment fractions, and thus make the silty loam suitable to investigate the potential effects of aggregation of original soil on the transport distances of differently sized sediment fractions."

Table 1 Mineral particle size distribution, soil organic carbon (SOC) distribution across mineral particle size, average SOC of bulk soil, and the percentage of stable aggregates greater than 250 µm in the silty loam used in this study.

	Mineral particle size (µm)					SOC of original soil ($g\ kg^{-1}$)	Aggregates greater than 250 µm (%)
	< 32	32-63	63-125	125-250	> 250		
Weight (%)	62.0 ±0.3	29.1 ±0.4	6.6 ±0.3	1.2 ±0.1	1.1 ±0.1		
SOC ($g\ kg^{-1}$)	13.7 ±0.7	3.0 ±0.3	8.9 ±2.6	21.9 ±0.8[a]	26.4 ±1.3[a]	10.8 ±0.4	67.2 ±6.9
SOC mass proportion (%)	80.8	8.3	5.6	2.5	2.8		

NOTE: a) might be over-estimated due to the mixture of minute amount of residue or straw, which was previously incorporated into the aggregates but then released by dispersion and blended with coarse particles.
Lower case numbers indicate the range of minimum and maximum values (n = 3).

(7) The same is for table 3. In the marks under the table please remove the information about methods, this information is for materials and methods section.

Answer: Table 3 will be changed in revised manuscript to:

Table 3 Summary of the erosional responses of Möhlin soil over 180 min of rainfall time. Subscripted numbers indicate the minimum and maximum range of the parameters (n = 3).

Steady state (after 120 min)			Total runoff (kg)	Runoff coefficient (%)	Total sediment yield (g)
Runoff rate ($mm \cdot h^{-1}$)	Sediment discharge rate ($g \cdot m^{-2} \cdot h^{-1}$)	Sediment concentration ($g \cdot L^{-1}$)			
18.0 ±0.9	168.7 ±14.4	9.4 ±0.1	40.7 ±3.1	20.6 ±1.6	475.8 ±74.6

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