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Interactive comment on "Phosphorus Transport in Subsurface Flow at Beech Forest Stands: Does Phosphorus Mobilization Keep up with Transport?" *by* Michael Rinderer et al.

Anonymous Referee #2

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General comments The manuscript entitled " Phosphorus Transport in Subsurface Flow at Beech Forest Stands: Does Phosphorus Mobilization Keep up with Transport? ", written by Michael Rinderer, Jaane Krüger, Friederike Lang, Heike Puhlmann, and Markus Weiler, presents valuable results that contribute to the understanding of phosphorus transport in and phosphorus losses from the soil. The topic falls into the scope of Biogeosciences. The manuscript comprises results from large sprinkling experiments at three beech forest sites in Germany. The methods are adequate to test the research questions. The results are described in detail and can be used to answer the research question. The text is easily understandable, tables and figures are well-arranged and the conclusions are sound. Hence, I would recommend to consider this

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manuscript for publication in Biogeosciences after minor revision.

Specific comments L 14 The values differ from those in Tab. 1. L75/76 The time oft he two experiments was not well chosen if microbial conditons – like soil moisture, temperature, litter fall – should differ. Rather late autumn/early winter (november; wet, cold, a lot of litter) and summer (july/august; dry, warm, less litter) should have been chosen. L 227 trise20 of the event water fraction is in Tab. 5 and trise20 of SSF in Tab. 4 L 233-252 Results oft he statistical analyses are not displayed anywhere and the statistical approach is not described in the materials and methods section. L 295/296 "A peak of high event water at the beginning oft he sprinkling experiments, . . .“ I could not find this result in the presented data (Fig. 3?). L 302 Tab. 1 (skeleton content) and Fig. 1 (soil bulk density) L 315-317 Why is the Ptot concentration from the mineral soil in vertical SSF in MIT lower than from the forest floor? L 339/340 This is only true for vertical SSF, isn't it? L345 This is predominately the case for LY1B, isn't it (Suppl. Tab. 1)? L 350/351 Which soil properties? L 361 It is unlikely that adsorption explains the difference, since adsorption is very small in the forest floor. How large was the P flow from the 3 sites in g/m2 (in cormparison tot he soil P stocks oft he 3 sites)? Compare it with values from the literature that you cited in the introduction (L 30 and others). Tab. 2 Why was the soil depth oft he installations in the subsoil in CON different from MIT? Tab. 4 and 5 You abbreviate both varaiables with trise20; better add "in SSF“ in Tab. 4 and "in event water fraction“ in Tab. 5. Fig. 3b Reorder the labels (TR1B, TR2B, TR3B) according to the labels in Fig. 3a (from forest floor to saprolite). Fig. 5 The unit of the flow on the x-axis is mm/h, isn‘ it?

Technical corrections L 29 forest ecosystem -> forest ecosystems L 66 In biopores -> Biopores L 171 chemotatic -> chemostatic L 225 paranthesis is missing L 287 suction caps -> suction cups L 332 Makoswski et al -> Makowski et al. L 338 suggest -> suggests L 345 was -> were L 357 and 370 expect -> except Tab. 1 Dominant vegetation and Annual precipitation for TUT: d -> c Fig. 5 and Fig. 6 Labels -> Label

Please also note the supplement to this comment:
https://www.biogeosciences-discuss.net/bg-2020-118/bg-2020-118-RC1-supplement.pdf

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