

Dear Mr Sato

thank you very much for the review and please find below in bold our modification following your points.

Dear Authors,

I went through items in your response letter, and I was satisfied with your revision except following concerns. Note that sentences in blue color are taken from your letter.

(1) Caption of the new figure 1

Explain the difference between arrows with solid and dashed lines.

**We added a detailed caption describing the scheme:**

***Pools and fluxes of the phosphorus component of ORCHIDEE:***

***“Phosphorus enters ecosystems in form of dissolved labile phosphorus from chemical weathering of minerals and atmospheric deposition. Dissolved labile phosphorus is the sole source for plants and microbes and can be reversibly adsorbed onto soil particles or lost by leaching. Adsorbed labile phosphorus can be transformed into more recalcitrant forms which are irreversibly lost to biota. When plants take up phosphorus from soils it enters the plant labile phosphorus pool, from which it is allocated to growing plant tissues. The plant labile phosphorus concentration is buffered by a reserve pool which serves as a long-term storage to buffer seasonal variations in phosphorus demand and supply. When plant tissue is shed part of the phosphorus is recycled (broken lines) while the remaining enters the litter pools from where it is either transformed into soil organic matter or mineralised.”***

(2)Page 6, line 22: "the actual value of  $f_{PN}^{plant}$  may be higher than 1" - what is the implication for plant P uptake? Is it realistic?

DSG: This is the justification for the  $\min()$  in the equation which was missing. we corrected the equation

It is difficult to understand this sentence as a justification for the  $\min(*, 1.0)$  in the equation 7. More easily comprehensible explanation is required here.

**We added a sentence to clarify the motivation behind the minimum function:**

***“Maximum uptake is reached when  $pn_{plant}$  equals  $pn_{leaf,min}$  by the use of a minimum function.”***

(3) P31, L21: typo? Should be "-44.7%" here.

DSG: corrected

NOT corrected.

**Corrected**

Best,

Hisashi SATO