

## ***Interactive comment on “Interrelationships among soil nitrogen transformation rates, functional gene abundance and soil properties in a tropical forest with exogenous N inputs” by Yanxia Nie et al.***

### **Anonymous Referee #2**

Received and published: 10 June 2019

Due to the complexity of nitrogen cycling in terrestrial ecosystems, it deserves to explore how elevated nitrogen deposition affects soil N transformations in the N-rich soil of tropical forests. Overall, this manuscript was well written and easy to read, but the current version is suffering from some critical defects. First, this study measured the net mineralization and nitrification, completely different from gross mineralization and nitrification. To this point, the title of this study is not appropriate, because net mineralization and nitrification actually include the balance of various transformation processes such as ammoniation and immobilization, which conceals real nitrogen transformation processes. Second, the descriptions in Methods are not detailed and thus affect understanding of the results. For example, the descriptions about the specific time for nitro-

C1

gen addition and sampling soil cores for net mineralization were unclear. Considering net mineralization is the difference of ammonium concentrations between 30 days, the time for nitrogen addition and the sampling of two soil cores is very important. If the sampling of second soil cores was just after nitrogen addition, mineralization could be overestimated because added N contributed to increase in soil ammonium concentrations. Third, it is well known that nitrogen addition will lead to soil acidification. However, this study did not separate from inorganic nitrogen input from its acidification (also see Fig. 6). This strongly reduces the importance of this study, e.g. both low pH and higher inorganic nitrogen concentrations can show negative effects on nitrogen transformations. Fourth, it is very good to include the measurements of N-related functional gene abundance, but it is a pity that N-related functional gene abundance was not related with the specific nitrogen transformation processes. As a result, it is difficult to make a microbial mechanism explanation for net mineralization and nitrification. Before the manuscript is accepted to publish, the above issues should be well clarified.

---

Interactive comment on Biogeosciences Discuss., https://doi.org/10.5194/bg-2019-101, 2019.

C2