

## ***Interactive comment on “Modeling the effects of litter stoichiometry and soil mineral N availability on soil organic matter formation” by Haicheng Zhang et al.***

### **Anonymous Referee #2**

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This study adapted a conceptual formulation of CUEd based on assumption that litter decomposers optimally adjust their CUEd as a function of litter substrate C to nitrogen (N) stoichiometry. The new model algorithm was incorporated into CENTURY soil biogeochemical model and evaluated using data from laboratory litter incubation experiments. The results showed that new CUEd formulation with flexible CUE and effect of N availability to decay rate was able to reproduce differences in respiration rate of litter with contrasting C:N ratios and under different levels of mineral N availability. It is well-written, logically organized, and the figures and tables are appropriate.

Figure 1 seems too simple to include other major processes mentioned in the method

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section. It should be considered to revise.

As the CUEd was defined as a fraction of it is respired to the atmosphere and the remaining fraction (Line 159-160), it is not correct to use  $1 - \text{CUEd}$  to simulate CO<sub>2</sub> emission in Fig. 1.

Equ (4) is important for this study, which has been used to develop one of model simulations (i.e. M1). However what is the fundamental assumption for adding N effects in the Equ (4)? N mineralization is accompanied with carbon decomposition. So, why use N availability to limit litter decay?

Line 71: need reference here.

Line 212: typo “The The C:N ratio”

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Interactive comment on Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2018-173>, 2018.

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