

Interactive comment on “Nitrogen isotopic fractionations during nitric oxide production in an agricultural soil” by Zhongjie Yu and Emily M. Elliott

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Review of bg-2020-344 by Yu and Elliott "Nitrogen isotopic fractionations during nitric oxide production in an agricultural soil"

The paper reports on the isotopic fractionation of source and sink processes underlying soil NO emissions, NO emissions being important for atmospheric chemistry and as a soil N loss pathway. I am impressed by this study, proving in-depth analysis of isotopic constraints on formation and consumption pathways of soil NO, and partitioning the contribution of nitrifiers and denitrifiers as well as abiotic reactions. The approach taken with aerobic, suboxic and anoxic soil incubations combined with inorganic N

C1

additions in live and sterile soils, N and O isotope measurements in inorganic soil N and NO, amended by isotope fractionation and flux modeling provides a most complete assessment of NO source and sink processes. This study therefore highlights that stable isotope measurements in inorganic soil N with those in NO and N₂O can help in source attribution of these important atmospheric gases.

Minor corrections can be found in the annotated PDF.

Lines 59-61: There are also complete ammonia oxidizing Nitrospira, that catalyze the whole nitrification reaction sequence from ammonia to nitrate in one organism (comammox bacteria). Line 80 and throughout the MS: it should always be kinetic isotope fractionation and equilibrium isotope fractionation. Line 189: please provide xg (RCF) instead of rpm. Line 374: The reference Zhu-Baker et al. (2015) is missing in the reference list and should be Zhu-Barker.

Please also note the supplement to this comment:

<https://bg.copernicus.org/preprints/bg-2020-344/bg-2020-344-RC2-supplement.pdf>

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2020-344>, 2020.

C2