

## ***Interactive comment on “Origin and fate of the secondary nitrite maximum in the Arabian Sea” by P. Lam et al.***

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Thank you very much for your positive and constructive comments. We will take them in due consideration in revising our manuscript. We would like to use the opportunity here to first address your detailed comments:

Page 2361, line 19: Reported are the limits of detection for ammonium, nitrite, nitrate and phosphate - as the minimum values that can be distinguished from zero based on our detection methods. These limits are actually very similar to our limits of quantification according to the standard curves generated during our analyses, but they are not listed in the current manuscript.

Page 2362, line 1: If the remineralized organic matter has an N:P ratio higher than

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the assumed Redfield stoichiometry ( $N:P > 16$ ), then the actual N-deficits will be greater than estimated by the calculated negative  $N^*$ , and vice versa. We chose to use  $N^*$  because it is currently the most commonly used estimator for N-balance in seawater. We will, however, add more discussion on the potential influence of remineralization of non-Redfieldian organic matter in the revised manuscript.

Page 2366 lines 4-5: We will change as suggested.

Page 2370 lines 19-22: Some possible alternative electron acceptors for redox cycling have been suggested for the Arabian Sea OMZ in the past, which include ferric iron, manganese oxides and iodate (Lewis and Luther, 2000; Farrenkopf et al., 1997; Moffett et al., 2000). We will add these in the revised manuscript.

Page 2371 lines 9-12: The lowest  $N_2$ -production rate that can possibly be measured with our  $^{15}N$ -incubation experiments is 0.15-0.20 nM d<sup>-1</sup>, and the few occasional detectable rates we reported for the central-NE Arabian Sea were considerably higher, in the range of 0.5-2 nM d<sup>-1</sup>. For the reaction-diffusion model, it theoretically can predict any rates that differ from zero. However, if the concentration data themselves are noisy, then the very small rates should be treated with caution.

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