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***Interactive comment on* “Nitrogen isotope dynamics and fractionation during sedimentary denitrification in Boknis Eck, Baltic Sea” by K. Dähnke and B. Thamdrup**

Anonymous Referee #2

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The paper by Dähnke and Thamdrup provides several interesting insights into nitrogen isotope dynamics at Boknis Eck time series station located in coastal part of the southern Baltic Sea. Thus, it meets the high standards of Biogeosciences and should be published in this journal. A set of data reaching from sediment and water column samples to incubation experiments was used to measure nitrate isotope signatures and fractionation in order to assess denitrification, here. The major point in this paper is the fact that sediment denitrification does indeed impact on water column nitrate isotope values. This point changes classical paradigms and demonstrates once more the need for further studies on the interplay of sediment and water column in marine systems. Moreover, the authors discuss the intracellular regulation and processing mechanisms

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with regard to the alternative use of two different nitrate reductases. This idea is interesting, however, a bit speculative, as well. With regard to this point, it could also be the case, that just the diversity of organisms that contribute to denitrification, here, is responsible for the difference of nitrate and nitrite processing, as it is to expect that different organisms react largely different to the same environments. All together, the manuscript is clearly written, understandable and the figures are well chosen .

Minor comments: p. 690 (4.1), p. 695 (4.4): The diversity of denitrifiers along with the absence of anammox based on molecular data and rate measurements is nicely shown in Bertics et al. (same issue), referring to this paper would strengthen the importance of denitrification at Boknis Eck. However, as the diversity of denitrifiers is not that high on the level of the nirS gene coding for the nitrite reductase, does it make sense then to speculate on higher diversity on the level of the nitrate reductase? p. 693 (4.3): Is nitrification to ammonium very likely, here? I assume that oxygen is nearly depleted in surface sediments. Could you give an oxygen concentration, here?

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