

Interactive comment on “The influence of seawater pH on U / Ca ratios in the scleractinian cold-water coral *Lophelia pertusa*” by J. Raddatz et al.

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Reply to Referee 1: Claire Rollion-Bard

First of all the authors would thank the referee very much for these very constructive comments which will help to improve the paper.

1) We agree with the referee, that the structure of our discussion can be improved by dividing our second part into one concerning the difference of uranium uptake of zooxanthellate and azooxanthellate corals and one concerning the microstructural variability as these topics are not necessarily related to each other. We have restructured the discussion in the revised MS.

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2) We have added the references suggested and discuss the differences between the implied pH of the COC from U/Ca versus B isotopes in the revised MS. However, COCs are known for their special trace metal incorporation so we avoided sampling the COC for most samples. The reason for the different behaviour of trace elements and isotopes in the COC remain unclear.

As we mention in our material and method section we drilled our bulk samples for the U/Ca – pH calibration with a dremel tool averaging several growth bands comparable to 3-4 micromill spots in our heterogeneity profile. Therefore such internal coral variations seen in our profile are not resolvable by measuring a bulk sample. For future studies this would be an interesting topic to enhance the U/Ca - pH calibration especially by LA-ICP-MS.

Minor comments: We have incorporated all minor comments and added also a new figure (Fig. 7 in 4.2) showing the relationship of U/Ca and Li/Ca of the bulk samples from the entire sample set as well as the intra coral profiles.

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