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Interactive comment on "Coral calcifying fluid aragonite saturation states derived from Raman spectroscopy" *by* Thomas M. DeCarlo et al.

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The submitted manuscript of DeCarlo et al. reports interesting innovative research results regarding the use of Raman spectroscopy for the determination of aragonite saturation state in inorganic experiments and during coral calcification. As such it is timely, of broad scientific interest and fits into the scope of BG.

I would expect this material to be publishable after careful revision.

Before explaining some of my concerns I need to underline I am not at all a Raman spectroscopy expert. Thus, Raman-specific technical details need to be reviewed by a respective expert before any decision on publication can be made.

In general I like this manuscript for it's interesting approach which warrents publication

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Discussion paper

in my opinion. Nevertheless, some conclusions, I think, should be presented more carefully, underlining the potential and open questions of this approach.

It appears strange to me, the calibration (inorganic) yields results for the coral which are presented as correct reconstruction of internal cf saturation state. The calibration in my opinion is not entirely correct or it is not very clearly explained. I'd tried to recalculate the regression based on the data provided in the supplements. It appears, the uncertainties of the saturation state data from the experiment have not been included in the uncertainty estimate of the calibration. It rather looks like the means of FWHM plotted vs. Omega and a log-fit applied. This is critical as later the FWHM is used to reconstruct Omega. I hope, the point is clear, it would need quite the opposite plot and fit, Omega vs. FWHM for a calibartion useful for the desired calculation. Well, the fit obviousely, changes in this case.

In any way, I could not replicate the Jcp-1 Omega of 12.3 with either of the calibrations. Could it be, each individual Raman result had been converted into a result for Omega and those results have been used to calculate an average of 12.3? If so, I did not get this from the manuscript... The Omega calculated from the mean FWHM would be >13, if I did the calculations right.

Considerring the large uncertainties of the source data (Omega from inorganic experiments), and the fact, that corals do not perform such experiments to grow their skeleton, it appears not realistc to claim the precise reconstruction of coral cf Omega +-1-2, as stated in the abstract.

Despite this critique I am confident and look forward to see this published as a paper in BG.

Cheers, Jan

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