

***Interactive comment on “Technical Note:
Detection of gas bubble leakage via correlation of
water column multibeam images” by
J. Schneider von Deimling and C. Papenberg***

Anonymous Referee #1

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This paper presents details of a study examining the use of MBES to measure the rise velocities of gas bubbles through a cross-correlation approach. As such, it has some novelty, and would be of interest to MBES users as a novel application of backscatter imaging. The paper is moderately well-written and illustrated but requires several points to be addressed:

1) The MBES is deployed from a boat, at a fixed position (3.1; 3.3) that presumably has some motion on this. . . it is impossible to think the vessel was in a completely fixed position with no movement. How is this motion quantified in assessing the bubble velocity since any boat movement needs to be subtracted from the horizontal component

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of velocities for bubbles from the MBES. Section 4.1, line 18, states that the vessel was ‘stationary’ and the bubbles were ‘hardly affected’ by velocities perpendicular to the swath. I think we need to see more data and proof of both how ‘fixed’ the vessel really was and the quantification of any flow velocities. An assessment of this, and the errors involved, is clearly required herein. Additionally, it would also be desirable to include some error/sensitivity analysis to assess the accuracy of the results obtained. 2) The paper requires better explanation of the processing steps for velocity determination, and in particular how this differs from other recent papers. The paper refers to the recent paper of Best et al. that also, I think, uses a cross-correlation approach. . . so what is new in the present contribution to this processing method as opposed to what is already in the literature? 3) A better account is required on a non-calibrated MBES and why this may not be important in this study as stated in 2.2. Would the fact that it is not calibrated affect the detection levels for different size bubbles? 4) How does bubble size affect the detection limits and what is the practical bubble size detection limitation present? 5) A better explanation is required on the determination of bubble velocity and background to the processing. What are the ‘automatic’ corrections for absorption and spreading? Why was there no raw data access and did this matter? 6) The difference between the on and off seep measurements would benefit from a statistical analysis of difference rather than just the visual presentation given in Fig. 5. 7) It would also be helpful to have a better explanation of the differentiation of bubbles from fish in the paper. 8) The phraseology and English require careful editing to bring them up to an acceptable level for publication. 9) Do not cite ‘unpublished results’ (3.1). if you refer to these and they are important, then show them herein. 10) It is more common to show upward velocities as positive and not negative in sign. 11) Section 3.4 is very unclear in many places. What does the sentence ‘The corresponding lateral displacement values of. . .’ really mean? How is on and off seepage related to possible vessel movement during the data collection period? 12) Section 4.1: where is justification for using ocean velocities less than 1 m/sec? 13) 4.1: justification and explanation of why backscatter analysis is very vulnerable to fish echoes and this approach is not? 14)

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4.1, p. 1766, lines 15-20: if this is important then I think you do need to show it here and explain and show why it is important. I do not think you can allude to the signal processing as being important but say 'not shown in this study'. Either show this or remove this text. 15) Section 4.1, lines 2-5, page 1767..vague wording and explanation here. 16) The figures are generally ok, but could be clearer and better labelled, although Fig. 4 is surprising in the few vectors present, and also a large vector on the right hand side that depicts movement to the left..what is this?..it looks larger than any bubble rise velocity?

Interactive comment on Ocean Sci. Discuss., 8, 1757, 2011.