

***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 #2**

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This technical note presents the initial stage of a new method to acoustically image seafloor gas escape. With further development, this could become a useful system to both detect and investigate seafloor seeps.

The need for multiple swaths collected over the same location currently limits the scope of applications for this method. The authors postulate that the next generation of multi-beam systems will have athwart swath steering. In addition to the authors' assertion that this would allow the mapping of bubbles in 3D, this added functionality could also potentially allow the system to function while the ship is underway. This would in turn convert the system from one that investigates previously located discharge sites to

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one that is able to identify these sites during the course of a routine seafloor mapping survey.

Additional functionality that would make this system particularly useful would be the ability to estimate the rate of discharge. The authors demonstrate the ability to compute the velocity and trajectory of individual gas bubbles and indicate that the rate at which bubbles rise is proportional to their size. Thus, converting this information to discharge rate should not be too far a stretch.

Overall, the manuscript is well written and presents the material well. There are occasionally a few awkward sentence structures, but in general, these do not hinder the reader's ability to understand the conveyed information. Two items need further clarification:

(1) On page 1762, lines 19-20, the authors indicate that, although their assessment survey was conducted in an area known for having gas seeps, they were unable to observe gas release. Were they using an independent method (i.e. one not associated with their multibeam system) to determine this information, or is it possible that bubbles were present but had unexpected physical properties that prevented the multibeam system from imaging them?

(2) Figure 5 nicely shows that the authors attribute computed velocities of  $\leq 0.1$  m/s to be related to system noise. However, a significant number of green (on-seep) vectors are confined to that box. Since the authors present a rise velocity of 0.1 m/s to be the lower limit for bubbles, do the authors interpret these vectors to also be related to system, or should there be concern that eliminating these vectors would also mean eliminating potential data points?

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

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