

Observation of methane plumes with quantitative echo sounder

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Quantitative echo sounder for fishery is a powerful tool to identify methane plumes from deep ocean floors, and has been commonly used for gas hydrate study worldwide. However, the precise position of gas venting has not easily obtained so far. This paper propose the method to exactly locate the venting sites.

The acoustic data of methane hydrate bubbles was obtained with quantitative echo sounder by staying in the methane hydrate upwelling area for a long period of time, and analyzed with the single fish detection function. As a result, the methane hydrate seeping spot was precisely located.

The circular graph on the display of the quantitative echo sounder represents the single target position. The center of this circle denotes the sound axis, that is, the center of the vibration plane of the transducer. The size of the circle represents the illumination range of pulse wave. In the case of EK60 (SIMRAD), the diameter of the circle is about 100 m at a depth of 1,000 m. If a seep point is found at the lower left of the circle, its location can be calculated accurately from the direction and distance from the center, because the location of the center, that is, the transducer, is already known with the GPS on the ship. In addition, by decreasing the threshold of the quantitative echo sounder, it is possible to detect the methane plumes with low backscatter intensity and the strong scattering bodies below the seabed. Consequently, it was found that the use of quantitative echo sounder is effective for the assessment for methane hydrate search.

Keywords: Quantitative echo sounder, Methane Hydrate, Methane Plume