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Methane seeps in the seafloor related to columnar acoustic blanking zone of the Ulleung Basin, East Sea, Korea

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The measurements of dissolved methane contents in the seafloor related columnar acoustic blanking zone in the Ulleung Basin have been carried out to identify methane seeps. USBL guided towed sled observation was conducted 7 sites with the water depths of 915 to 2148 m by using the R/V Tamhae-II in 2009. The towed sled consists of METS methane sensors, CTD, and video camera. These sites are characterized by high multi-beam backscattered intensity but no typical gas flares were detected from the EK60 echo-sounder images. In the five sites, concentration of dissolved methane was very high at the interval deeper than 1300 m water depth. We found the near-seafloor gas hydrates and methane-derived authigenic carbonates around the sites. The other two sites also located on the seafloor related to the columnar acoustic seismic blanking zone. But the concentrations of dissolved methane were not higher than those of the other five sites, suggesting an inactive cold vent. The near-seafloor gas hydrates were also found from the other two sites. An activation of the cold vent could be explained by the presence or absence of vent outlets for upward gas and fluid migration.