



3D Seismic Analysis of Geometry and Spatial Distribution of Seismic Chimney in the Ulleung Basin, East sea of Korea

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Analysis of seismic data acquired in the Ulleung Basin, East Sea of Korea reveals a number of seismic chimneys characterized by velocity pull-up and reduced reflectivity. These seismic chimneys probably result from fluid-gas upwelling into the gas hydrate stability zone. Based on the geometry and distribution patterns, seismic chimneys in the study area can be divided into two groups. Group 1 is characterized by seismic chimneys vertically grown to near surface with sub-circular geometry, whereas Group 2 is characterized by seismic chimneys buried within subsurface with elliptical geometry. According to their distribution pattern, Group 1 is dominant in SE part of the study area, where fault system is rarely developed, while Group 2 is dominant in NW part of the study area, characterized by vertically faulted system within the strata. Group 1 shows a large dimension and low frequency of occurrence, whereas Group 2 shows relatively small dimension and high frequency of occurrence. These results suggest that Group 1 is interpreted as high flux seismic chimney, while Group 2 is interpreted as low flux seismic chimney associated with vertically faulted system.