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The delineation of methane hydrate-bearing zone using multi seismic attributes analysis

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Abstract: The result of MITI Nankai Trough wells drilled in 1999-2000 proved the occurrence of methane hydrate in the Nankai Trough area from recovered core and well logging data. This result gave a big impact on both the Japanese strategy for energy and scientific interest. And it eventually motivated Japanese government to commence the national project named “Japan's Methane Hydrate Exploitation Program”, which started since 2001. From the results of the 2D and 3D seismic survey acquired in the Nankai Trough area by METI in 2001 and 2002, widely-distributed BSR was recognized in the area, which was expected the wide distribution of methane hydrate. For the volume quantification, we needed to evaluate reservoir parameters of methane hydrate reservoir such as thickness, saturation, and porosity of sediments. And we inferred methane hydrate bearing layers are inhomogeneous and discontinuous in space and depth. And we also found a good correspondence between methane hydrate layer and the zone which is characterized by seismic attribute as high P-wave velocity, high P-wave impedance, high S-wave impedance, low pseudo Poisson's ratio and high attenuation. Consequently, we conclude that the pre- and post-stack seismic attributes are so helpful tools to delineate the methane hydrate reservoir.

Key words: [methane hydrate](#), [seismic attribute](#), [reservoir characterization](#), [P-wave impedance](#), [S-wave impedance](#), [pseudo Poisson's ratio](#), [attenuation](#)

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