

Three-dimensional seismic imaging in the mud volcanoes in Kumano Basin

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We conducted a mini 3D seismic survey at Daigo and Dairoku Kumano knolls in June 2004 to reveal the geological structure beneath these twin mud volcanoes using 600m-long, 24 channel streamer cable and a GI gun with 150 in³ chamber. The 3D box is 3.3km wide and 2.5km long covering two mud volcanoes. From 2D post stack migrated sections, we reported the BSR distribution map in and around the mud volcanoes, which suggests that the gas hydrate may be strongly related with the activity of these mud volcanoes. We created a pseudo 3D reflection volume by interpolation of 2D images to seize 3D structure of the mud volcanoes. The 3D volume shows that 'umbrella'-like structure is well developed especially beneath the Dairoku Kumano knoll. The 'umbrella' structure is observed as a few peaks beneath the twin mud volcanoes. The Kumano basin sediment abuts to the 'umbrella', which suggests that these 'umbrellas' indicates the buried ancient mud volcanoes. From these observations, we propose the history of these mud volcanoes like following; the mud volcanoes have repeatedly erupted through more than one conduits originating from roughly unique mud diapir. Three dimensional processing is now undergoing. We will show preliminary results of the 3D processing in the presentation.