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№ 1434

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August 27, 2019

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Due to particularities of water and characteristics of ocean detection technology, the most effective method for detecting the shallow sediments on the seabed is still sub-bottom profile, which based on the hydroacoustic principle. Sub-bottom profile is mainly used in marine scientific research, submarine geological structure detection, and marine engineering.

The characteristics of parametric sonar includs small aperture, low frequency, wide band, high directivity and no-sidelobe beam. This kind of sonar can greatly improve the detection resolution and suppress noise. These technical advantages, determine the parametric sonar is suitable for shallow sediment detection.

Coherence technique is known as one of the most important breakthroughs in the field of seismic exploration in recent decades.Compared with the previous method of revealing underground anomalies, coherence technique can more clearly identify faults and stratigraphic features. This method is the calculation of the similarity of local seismic waveforms in seismic volume. Zones with low coherence values are closely related to strata with poor continuity, such as faults, special lithologic structure boundaries, and so on. Slice of coherence attribute data volume provides strong evidence for reservoir identification and description.

The parametic array sub-bottom data used in this study is collected from gas hydrate potential

area of the East China Sea. After mesh construction and interpolation smoothing, a three-dimensional data volume is formed. After calculating, the coherence attribute data volume is obtained. The profiles of the data clearly reflect the discontinuity of sub-bottom stratum. It is considered that these discontinuities would be related to blank zone. it is suggested that the sedimentation around blank zone may be different from normal sub-bottom. In addition, the largest continuity interruption occurs at the gas chimney zone, which may be related to free gas charge (Fig. 1).

The study area is roughly divided into two parts by the trough from northwest to southeast on slice. The elevation of northwest is higher than the southeast. Comparing coherence slices of different depth, there is good correspondence between the low coherence regions and the blank zones, especially the gas chimney areas (Fig.2). The boundaries of anomalous areas are significantly more clear than conventional seismic data. Considering the relationship between gas chimney and hydrate, the gas hydrate can be well identified.

Keywords:， Parametic Array, Sub-bottom Profile, Coherence Technique, Gas Hydrate

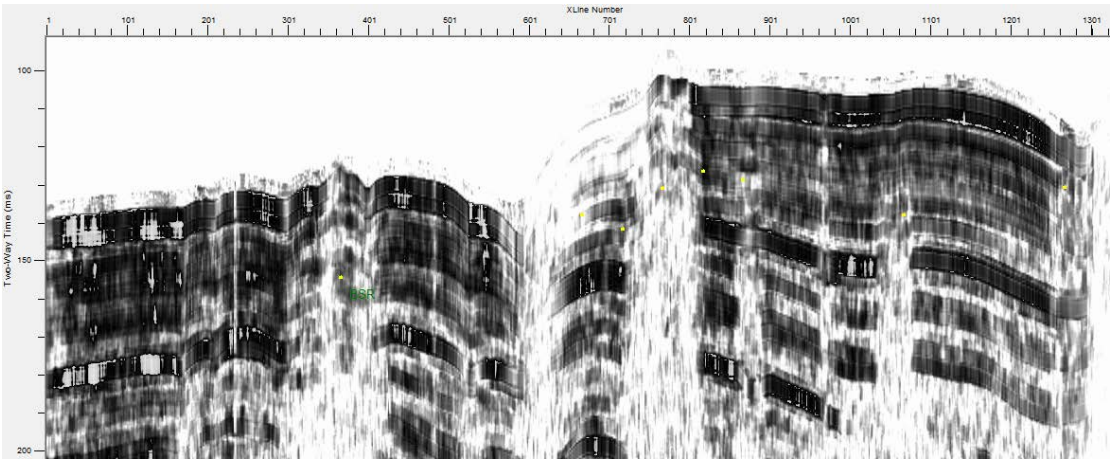

Fig. 1 Coherence attribute profile of inline A

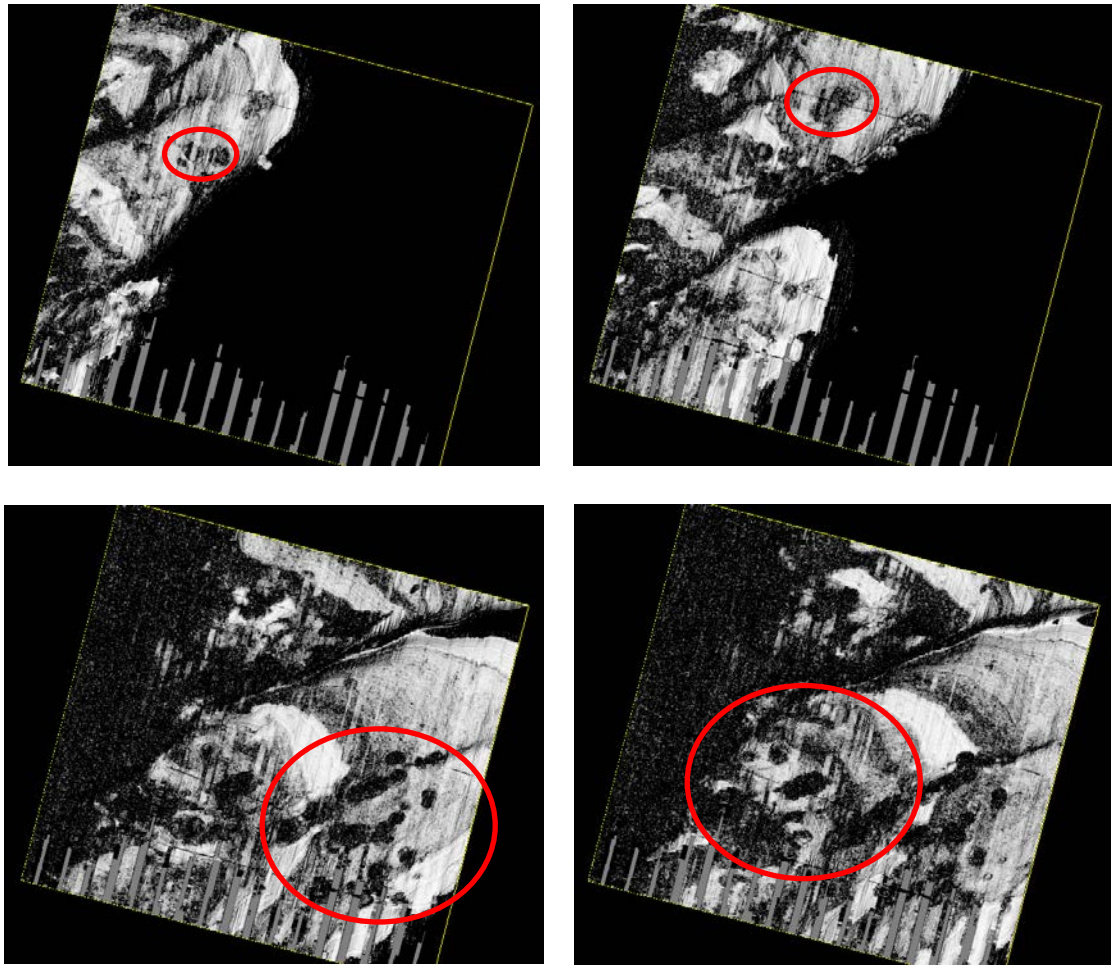

Fig. 2 Coherence attribute slices of parametic array sub-bottom data

Leftup: 125ms below the seafloor (bsf); Rightup: 145ms bsf;
Leftdown: 190ms bsf; Rightdown: 205ms bsf