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Delineation and assessment of gas-hydrates in Krishna-Godavari basin, eastern continental margin of India

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We have delineated the lateral extension of gas-hydrates and evaluated their resource potential along 6 in-lines and 6 cross-lines (totaling to ~100 line km) of multi-channel seismic data in Krishna-Godavari (KG) basin in the eastern margin of India. The lines are passing through the drilling site 10 of Expedition-01 of Indian National Gas Hydrate Program, from where massive gas-hydrates were recovered in 2006. The data are processed at close intervals (62.5 m) to build the best possible velocity models along all the lines. Since the velocity of pure gas-hydrates is much higher than that of normal oceanic sediments, presence of gas-hydrates within sediments increases the seismic velocity against the background (without gas-hydrates) trend. Hence, the high velocity anomaly has been utilized for the detection and delineation of gas-hydrates bearing sediments, which have been further characterized by computing attenuation and other seismic attributes. Finally, the rock physics modeling has been employed to translate the velocity anomaly in terms of lateral and vertical saturation of gas-hydrates. The results show saturations of gas-hydrates varying between 5 to 50% along various lines in the study area of ~14.7 sq km. The density porosity log at site 10 exhibits average porosity of 60%. The average thickness of hydrate-bearing sediments is ~168 m, and the average volume saturation of gas-hydrates is estimated as 12.28%. The total volume of gas within gas-hydrates is estimated as $51.56 \times 10^9 \text{ m}^3$ in the study area of KG basin.

