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Timing of trap formation and hydrocarbon generation in the northern East China Sea shelf basin

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Basin modeling and cross-section restoration from the northern East China Sea shelf basin reveal the timing of trap formation and hydrocarbon generation. Cross-section restoration suggest that extension started in the Late Cretaceous and was interrupted by inversion at the end of Miocene that created large anticline structures, providing numerous hydrocarbon traps. One-dimensional basin modeling of the JDZ-VII-I well show that the main phase of oil generation in the synrift fluvial shales in the Jeju Basin occurred during the early Oligocene- middle Miocene period, predating the regional inversion. Thus, potential for large oil accumulations in the southern part of the basin is probably limited. Most of the hydrocarbons are likely to have flowed towards the basin margin as well as basin centre until the Late Miocene because no structures were available to capture them. The formation of anticline structures overlapped and/or postdated the main phase of gas generation in the Jeju Basin. This is probably why the JDZ-VII-1 is gas-prone with the gas trapped mainly in the anticlinal structures formed by the tectonic uplift. The source rocks in the southwestern part of the Domi Basin are immature for hydrocarbon generation.