

## **Insights into Kinematics and Basin Development through Palinspastic Reconstructions in Pull-Apart Basin Sunda Strait: Implication for the Opportunity of Hydrocarbon Exploration in Fore-Arc Basin, Western Indonesia**

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**Abstract :** This study investigates the kinematics and basin development of pull-apart basin Sunda Strait based on palinspastic reconstructions of new acquired seismic reflection data to unravel hydrocarbon exploration opportunity in frontier area, fore-arc basin western Indonesia. We use more than 780 km seismic reflection data that cover whole basin. Structural patterns in Sunda Strait are dominated by northwest-southeast trending planar and listric-normal faults which appear to be graben and half-graben system. The main depocentre of this basin is East Semangko graben and West Semangko graben that are formed by overstepping of Sumatra Fault Zone and Ujungkulon Fault Zone. In father east, another depocentre is recognized as the Krakatau graben. The kinematic evolution started in Middle Miocene, characterized by the initiation of basement faulting with 0% to 7.00% extension. Deposition stratigraphic unit 1 and unit 2 started at 7.00% to 10.00% extension in Late Miocene and recognized as pre-transtensional deposit. The Plio-Pleistocene unit 3 and 4 were deposited as syn-transtensional deposit with 10.00% to 17.00% extension contemporaneously with the initiation of uplift NW-SE trending ridges due to the evolution of cross-basin fault in central basin and the development of en-echelon basin margin in a transtensional system. The control of sedimentation rate and basin subsidence cause the Neogene sediment to be very thick. We suggest that both controls allow thermal and pressure to generate hydrocarbon habitats in the pre-transtensional deposits. It is reinforced by stable kinematic evolution and interpretation of the deposition environment of pre-transtensional deposits that are deposited in the marine environment.

**Keywords :** kinematics, palinspastic, Sunda Strait, hydrocarbon exploration, fore-arc basin

**Conference Title :** ICGES 2018 : International Conference on Geology and Earth Systems

**Conference Location :** Tokyo, Japan

**Conference Dates :** September 10-11, 2018