

ABSTRACT

ANALYSIS OF BASIN AND GEOLOGICAL STRUCTURE BASED ON MAGNETOTELLURIC AND GRAVITY DATA ON KUTAI BASIN, EAST KALIMANTAN PROVINCE

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Kutai basin is the biggest and deepest Tertiary sediment basin in Indonesia. Basin in East Borneo is a product of subsidence occurred during Tertiary period caused by basement rift that happened because of Sea floor spreading on Makassar Strait and considered as the initial development of Kutai Basin. Makassar Strait sea floor spreading allow half graben to be formed, simultaneously sediment material fill in the basin, hence the deep basement of Kutai Basin. Therefore, magnetotelluric and gavity method is used, because it has great penetration and capable of delineating subsurface geological condition of Kutai Basin.

Disturbance during magnetotelluric acquisition caused data deviation (noise) these deviation affect signal coherence quality. Time Series Analysis is used to minimize data deviation (noise), to make signal coherence quality increasing. Magnetotelluric used to delineate depth and thickness of source rock and Kutai Basin top basement. Whereas gravity method used to identify subsurface geology structure

Time Series Analaysis resulting in improved quality of magnetotelluric signal coherence indicate an increase in the signal coherence value which was originally 70.29% to 72.24%. 2D magnetotelluric inversion and forward modeling 2.5 D gravity, show layers of rock containing organic content with a thickness of approximately 5000 meters has resistivity values from 2 Ω m to 6 Ω m and density of 2.15 gr / cc to 2.25 gr / cc. The boundary of the top basement is at a depth of approximately from 8000 meters to 9000 meters. Basement in the Kutai Basin has a resistivity value more than 30 Ω m and density from 2.72 gr / cc to 2.79 gr / cc, interpreted as metamorphic rock.

Keyword : *Basement , Coherence, Density, Gravity, Kutai Basin, Magnetotelluric, Organic Content , Resistivity , Time-Series*