

ABSTRAK

ANALISIS PERBANDINGAN *PRE STACK TIME MIGRATION* DAN *POST STACK TIME MIGRATION* MENGGUNAKAN METODE *KIRCHHOFF* PADA DATA SEISMIK 2D *MARINE* DI WILAYAH PERAIRAN ARAFURA, PAPUA BARAT

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Perairan Arafura merupakan perairan yang terletak di wilayah Papua sampai perbatasan Benua Australia. Daerah ini memiliki geologi yang kompleks karena melibatkan interaksi antara 2 lempeng, yaitu Lempeng Australia dan Lempeng Pasifik. Metode seismik menjadi salah satu metode geofisika yang banyak digunakan dalam memodelkan struktur geologi di bawah permukaan bumi karena memiliki ketepatan serta resolusi yang tinggi. Migrasi seismik menjadi tahap penting untuk memindahkan reflektor pada posisi dan waktu pantul yang sebenarnya serta menghilangkan efek difraksi akibat adanya suatu struktur tertentu. Pada penelitian ini dilakukan migrasi *Kirchhoff* sebelum dan sesudah *stack* dalam domain waktu pada data seismik 2D lintasan 12 di Perairan Arafura, Papua Barat. Pada akhir penelitian dilakukan perbandingan dan analisa terhadap penampang *pre stack* dan *post stack time migration* serta menganalisa struktur geologi yang tercipta pada daerah penelitian. Hasil penelitian menunjukkan bahwa penampang *pre stack* menghasilkan citra bawah permukaan yang lebih baik (reflektor lebih tegas dan kontinu) dibandingkan dengan penampang *post stack*. Struktur geologi yang tercipta pada daerah penelitian didominasi oleh sesar normal. Berdasarkan analisis penampang bawah permukaan diidentifikasi adanya cekungan pada daerah penelitian.

Kata Kunci: Kirchhoff, Migrasi Seismik, Pengolahan Seismik

ABSTRACT

A COMPARATIVE ANALYSIS OF PRE STACK TIME MIGRATION AND POST STACK TIME MIGRATION USING KIRCHHOFF METHOD ON 2D MARINE SEISMIC DATA IN THE ARAFURA WATERS AREA, WEST PAPUA

By

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The Arafura Waters located in the Papua region up to the border of the Australian Continent. This area exhibits complex geology due to the interaction between two tectonic plates, namely the Australian Plate and the Pacific Plate. Seismic method is one of the geophysical methods that is widely used in modeling geological structures beneath the earth's surface because it has high accuracy and resolution. Seismic migration is a crucial stage in relocating reflectors to their actual positions and times of reflection, as well as eliminating diffraction effects caused by specific geological structures. In this research, Kirchhoff migration was performed before and after stacking in the time domain on 2D seismic data along line 12 in the Arafura Waters, West Papua. At the final stage of the study, a comparison and analysis were conducted on pre-stack and post-stack time migration sections, along with an examination of the geological structures that is delineated in the study area. The research results show that the pre-stack section produces a superior subsurface image (the reflectors are more defined and continuous) compared to the post-stack section. The geological structures observed in the study area are predominantly characterized by normal faults. Based on the analysis of subsurface sections, the presence of a basin in the research area has been identified.

Keywords: *Kirchhoff, Seismic Migration, Seismic Processing*