

## INTISARI

### PENGOLAHAN DATA SEISMIK LAUT 2D DAN INTERPRETASI MORFOTEKTONIK DAERAH PALUNG SERAM

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Busur Banda memiliki tumbukan antar lempeng yang sangat menarik. Tumbukan antar lempengnya membentuk geometri huruf U. Banyak sekali perdebatan tentang bagaimana bentuk geometri huruf U terbentuk. Terdapat dua teori yang menjelaskan bagaimana Busur Banda terbentuk yaitu model *single slab* dan model *double slab*. Model *double slab* menjelaskan terjadi subduksi di bawah palung seram, sedangkan model *single slab* menjelaskan bahwa subduksi di palung seram tidak terjadi. Untuk wilayah Seram, deformasi dan vulkanismenya tidak dapat dijelaskan dengan model subduksi yang sederhana. Analisis morfotektonik dengan menggunakan metode seismik dilakukan untuk mengetahui morfologi di bawah palung Seram dan mengetahui pengaruh dari aktivitas tektonik yang ada. Sebelum melakukan interpretasi morfotektonik, terlebih dahulu dilakukan pengolahan pada data seismik untuk meningkatkan rasio sinyal terhadap *noise*. Selain itu, juga digunakan metode F-K Filter dan Transformasi Radon untuk menghilangkan/mereduksi multipel.

Pengolahan data seismik dilakukan dari pengolahan data awal dengan berbagai macam metode seperti *filtering*, dekonvolusi, *muring* dsb. Selanjutnya, untuk menghilangkan/mereduksi multipel digunakan metode F-K Filter dan Transformasi Radon sampai didapatkan *migration section*. Interpretasi data dilakukan dengan cara memvalidasi data hasil pengolahan dengan tatanan geologi regional daerah penelitian dan berdasarkan penelitian yang telah dilakukan sebelumnya.

Hasil dari pengolahan data didapatkan kandungan sinyal terhadap *noise* yang lebih tinggi. Metode F-K Filter mampu mereduksi multipel dan metode Transformasi Radon mampu mempertajam dan memperjelas reflektor. Hasil dari interpretasi morfotektonik menunjukkan bahwa palung Seram terbentuk karena kompresi dari Kepala Burung Papua menuju *Seram Fold Thrust Belt* akibat tumbukan intra lempeng *oblique*. Palung Seram bukanlah palung subduksi melainkan hanya laut dalam yang disebabkan karena kompresi, sehingga palung Seram lebih mendukung pada model *single slab* daripada model *double slab*.

**Kata Kunci** : seismik laut 2D, F-K Filter, transformasi radon, morfotektonik, palung Seram.



## ABSTRACT

### ***2D MARINE SEISMIC DATA PROCESSING AND MORPHOTECTONIC INTERPRETATION OF SERAM TROUGH AREA***

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Banda arcs have collisions between plates which are very interesting. The collision between the plates forms the U-shape geometry. There is a lot of debate about how the U-shape geometry is formed. There are two theories that explain how the Banda Bow is formed, the single slab model and the double slab model. The double slab model explains the subduction under the Seram trough, while the single slab model explains that subduction in the Seram trough does not occur. For the Seram region, the deformation and volcanism cannot be explained with a simple subduction model. Morphotectonic analysis using seismic method was carried out to determine the morphology under the Seram trough and to determine the effect of the existing tectonic activities. Before doing morphotectonic interpretation, seismic data is processed first to increase the signal to noise ratio. Besides that, the F-K Filter and Radon Transformation method is also used to eliminate / reduce multiple.

Seismic data processing is carried out from the initial data processing with various methods such as filtering, deconvolution, muting, etc. Furthermore, to eliminate / reduce multiple the F-K Filter and Radon Transformation method are used until a migration section is obtained. Data interpretation is done by validating the results of data processing with the regional geological order of the study area and based on previous research.

The results of data processing obtained a higher signal to noise. The F-K filter method is able to reduce multiple and the Radon Transform method is able to sharpen and clarify the reflector. The results of morphotectonic interpretation show that the Seram trough was formed due to compression from the Papua Bird's Head towards the Fold Thrust Belt Seram due to intra-oblique plate collision. The Seram trough is not a subduction trough but only the deep sea caused by compression, so the Seram Trench is more supportive of the single slab model than the double slab model.

**Keywords:** 2D Marine seismic, F-K Filter, Radon Transformation, morphotectonic, Seram trough