Wahana Fisika

Journal homepage: https://ejournal-science.upi.edu/wafi/

Title : Penafsiran Struktur Wahana Fisika terhadap Fisika di Bandung

Xxxxx Yyyyy[1], Dddd Rrrr[1], Yyy Fsss[2]

[1]Departemen Fisika UPI, Jl. Dr. Setiabudi No.229, Bandung 40154
[2]Pusat Penelitian dan Pengembangan Geologi Kelautan, Jl. Dr. Djunjunan No.236 Bandung 40174

* Corresponding author. E-mail: *xxxx2026@gmail.com*

NOMOR HP/Whatsapp DI SINI (UNTUK Korespondensi dengan editor, tak akan dicantumkan ketika terbit)

ABSTRAK

Abstrak harus berdiri sendiri, artinya tidak boleh ada kutipan, gambar, atau format persamaan di dalam abstrak. Anggaplah abstrak sebagai iklan untuk artikel Anda. Abstrak harus memberi tahu calon pembaca apa yang telah Anda lakukan dan menyoroti temuan utama. Buat abstrak dalam bahasa Inggris jika manuskrip hanya satu bahasa (Inggris dan Bahasa Indonesia), tetapi buat dalam dua bahasa (Inggris dan Bahasa Indonesia) jika manuskrip dalam Bahasa Indonesia. Hindari penggunaan jargon teknis dan singkatan yang tidak umum. Anda harus akurat, singkat, jelas, dan spesifik. Gunakan kata-kata yang mencerminkan makna yang tepat. Abstrak harus tepat dan jujur. Harap ikuti batasan kata (100-250 kata). Abstrak harus memuat: latar belakang kebaruan (maksimum 2-3 kalimat), tujuan yang singkat dan jelas, metode yang singkat, hasil atau temuan akhir, dan kesimpulan. Kata kunci adalah label manuskrip Anda dan sangat penting untuk pengindeksan dan pencarian yang benar. Oleh karena itu, kata kunci harus mewakili isi dan poin penting artikel Anda. Gunakan hanya singkatan yang sudah mapan di bidang tersebut, misalnya

INFO ARTIKEL

Sejarah Artikel:
Diserahkan Juni 2024
Revisi pertama Juni 2024
Diterima Juni 2024
Tersedia secara online Juni 2024
Tanggal Publikasi Juni 2021

Kata Kunci:
gaya berat; struktur; stratigrafi; pemodelan 2D; Perairan Arafura.

CATATAN PENTING :

1. Jumlah halaman minimal 8.
2. Referensi minimal 10
3. Nomor HP dicantumkan
4. User akun OJS harus diisi dan ditambahkan penulis sesuai artikel
5. Mengisi referensi di artikel
6. Mengikuti ketentuan dari dewan redaksi yang akan disampaikan via Whatsapp

DNA. Setiap kata/frasa dalam kata kunci harus dipisahkan oleh titik koma (;), bukan koma (,).

ABSTRACT

An abstract should stand alone, which means that no citation and figures and equation format in the abstract. Consider it the advertisement for your article. The abstract should tell the prospective reader what you did and highlight the key findings, make abstract in English when manuscript one language English, but make for two languages (English and Bahasa Indonesia) when manuscript in Bahasa Indonesia. Avoid using technical jargon and uncommon abbreviations. You must be accurate, brief, clear and specific. Use words that reflect the precise meaning. The abstract should be precise and honest. Please follow the word limitations (100-250 words). The abstract must contain: backgrounds of novelty justification (maximum 2-3 sentences), short clear objective(s), short methods, final results or findings, and conclusion. Keywords are the labels of your manuscript and critical to correct indexing and searching. Therefore, the keywords should represent the content and highlight of your article. Use only those abbreviations that are firmly established in the field. e.g. DNA. Each word/phrase in keyword should be separated by a semicolon (;), not a comma (,).

ARTICLE INFO

Article History:
Submitted/Received June 2024
First Revised June 2024
Accepted June 2024
First Available online June 2024
Publication Date June 2024

Keyword:
gravity; structure; stratigraphy; 2D modeling; Arafura Waters.

DOI: https://doi.org/10.17509/wafi.xxxx
e- ISSN 2549-1989

1. Pendahuluan

In the Introduction, Authors should state the objectives of the work at the end of the introduction section. Before the objective, Authors should provide an adequate background (maximum 1 paragraph), and very short literatures survey/review in order to record the existing solutions/method, to show which is the best of previous researches, to show the main limitation of the previous researches, to show what do you hope to achieve (to solve the limitation), and to show the scientific merit or novelties of the paper. Avoid a detailed literature survey or a summary of the results. Do not describe pieces of literature survey/review as author by author, but should be presented as group per method or topic reviewed which refers to some literatures. Before the objectives and after the literatures review, author must state the research gap analysis and/or novelties statements to show why does this paper is important and what is unique idea of this paper compared to other previous researchers' suggestions.

One of the examples of novelty statement or the gap analysis statement in the end of Introduction section (after state of the art of previous research survey):

"..... (short summary of background)..... .....(put here state of the art or overview of previous researches similar to this research)..... A few researchers focused on ..... There have been limited studies concerned on ..... Therefore, this research intends to ..... The objectives of this research are .....".

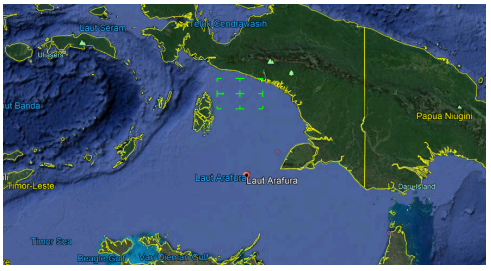
or

"..... (short summary of background)..... .....(put here state of the art or overview of previous researches similar to this research)..... A few researchers focused on ..... There is no researcher concerned on ..... Therefore, this research focuses on ..... Therefore, this research is aimed to .....".

etc.

Authors should state the objectives of the work at the end of the introduction section.

1.1 Geologi Daerah Penelitian

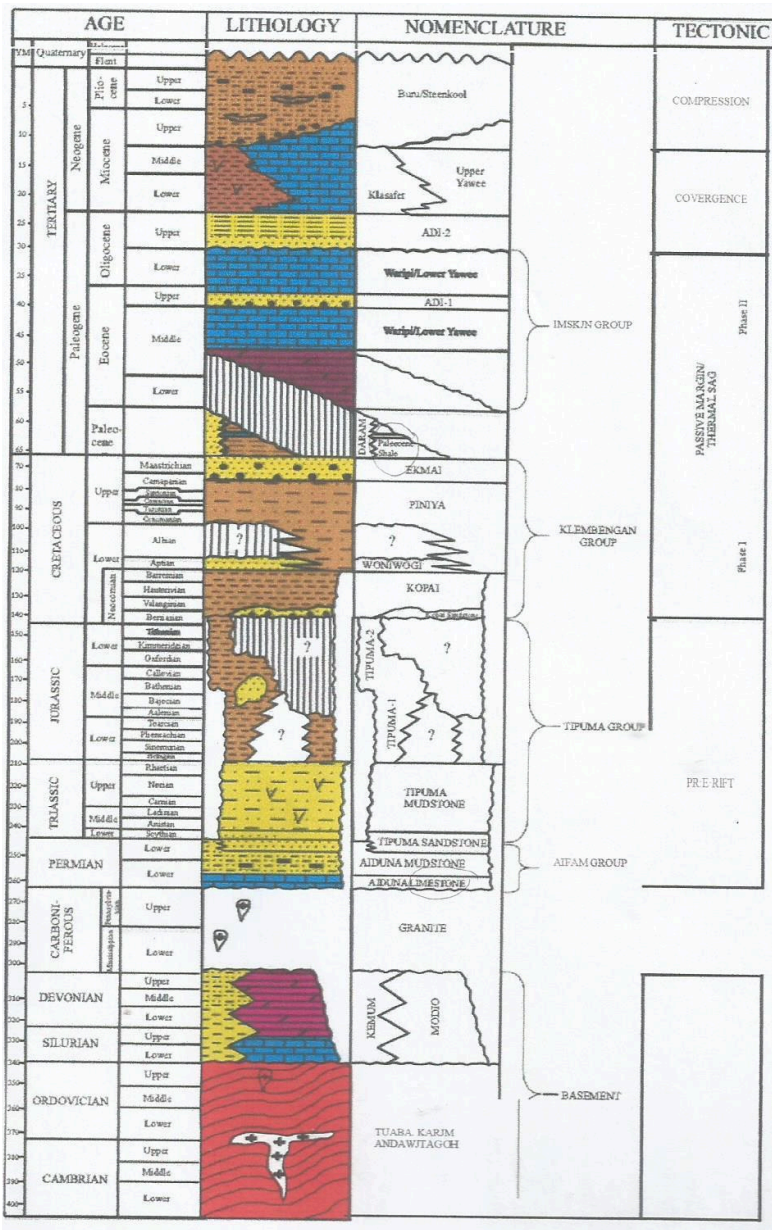


Gambar 1. Lokasi Penelitian

Penelitian dilakukan di wilayah Perairan Arafura. Lokasi penelitian berada di koordinat 135,06˚ - 136,52˚BT dan -6,07˚ - -4,46˚LS. Laut Arafura merupakan perairan di Indonesia yang berdasarkan kedalamannya termasuk perairan dangkal dengan kedalaman berkisar antara 30-90 meter [3]. Laut Arafura terletak di Papua bagian selatan sampai perbatasan Benua Australia. Batas-batas dari Laut Arafura, yaitu sebelah utara berbatasan dengan Laut Seram dan Pulau Papua, di sebelah selatan berbatasan dengan Pantai Utara Australia, di sebelah barat berbatasan dengan Laut Banda dan Laut Timor, dan bagian timur berbatasan dengan Pulau Dolak dan Semenanjung Don. Letak Laut Arafura ditunjukkan oleh gambar 1.

Stratigrafi Perairan Arafura dikontrol oleh proses sedimentasi batuan yang diakibatkan proses tektonik pembentukan dan pergerakan lempeng Benua Australia sejak Neo-Proterozoikum hingga saat ini. Stratigrafi wilayah Arafura dapat didasarkan pada stratigrafi yang ditunjukkan pada gambar 2.

DOI: https://doi.org/10.17509/wafi.xxxx
e- ISSN 2549-1989



Gambar 2. Stratigrafi Daerah Papua Bagian Selatan dan Arafura (Harahap, 2012)

(Gambar harus jelas)

Akibat adanya hasil tumbukan antara tiga lempeng besar, yaitu Lempeng Indo-Australia, Lempeng Pasifik, dan Lempeng Eurasia, maka kerangka tektonik yang dimiliki oleh wilayah penelitian ini adalah kerangka tektonik yang komplek. Dasar Laut Arafura yang berupa laut dangkal dengan dataran rendah Papua Selatan membentuk paparan Arafura yang tersusun oleh blok kaku (*rigid*).

2. Metode Penelitian

Materials and methods should make readers be able to reproduce the experiment. Provide sufficient detail to allow the work to be reproduced. Methods already published

should be indicated by a reference: only relevant modifications should be described. Do not repeat the details of established methods. For the chemicals, please provide details of brand and purity (example: CaO (Merck, 99.5%)) first, and state the concentration of chemicals in the procedure of the experiment. For the equipment instruments, please provide details of brand and type (example: "Gas Chromatography Mass Spectometry (Shimadzu QP2010 SE, Propapak Q column)" , "X-ray Diffraction (Shimadzu MAXima_X XRD-7000)", etc.

2.1 Konsep Dasar Gaya Berat

Gayaberat merupakan salah satu metode geofisika yang digunakan untuk menggambarkan struktur geologi bawah permukaan berdasarkan variasi medan gravitasi bumi akibat perbedaan densitas secara lateral [4]. seperti pada persamaan 1. berikut:

$$F = G\frac{m_1.m_2}{r^2} \qquad (1)$$

dengan:

F = Gaya tarik menarik antara dua benda 1 dan 2

G = Konstanta gaya berat ($6{,}672 \times 10^{-11}$ $m^3/kg\ s^2$)

m_1 = massa benda 1

m_2 = massa benda 2.

Tabel 1. Nilai Densitas Berbagai Tipe Batuan (Telford, 1990)

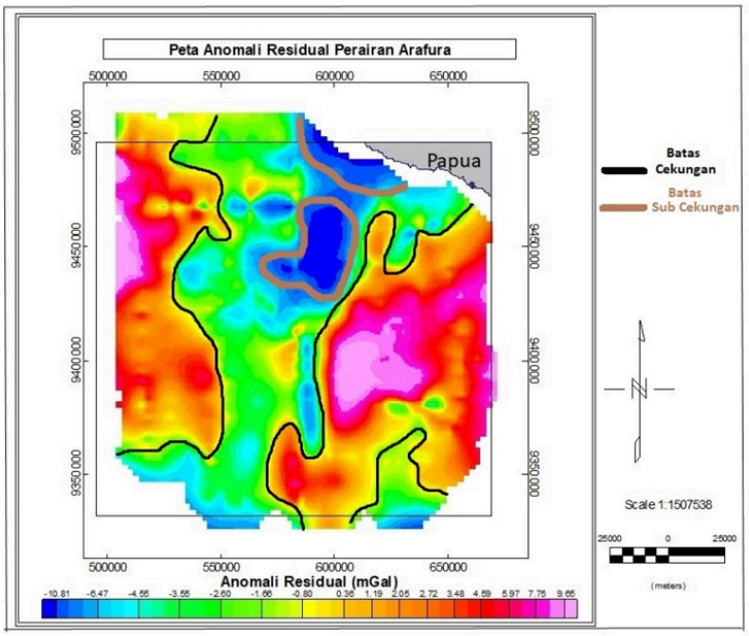
(Tabel harus moda horizontal tanpa batas vertikal)

Tipe Batuan	Rentang Densitas (g/cm^3)	Densitas Rata-rata (g/cm^3)
Sediment (wet)		
Overburden		1.92
Soil	1.2-2.4	1.92
Clay	1.63-2.6	2.21
Gravel	1.7-2.4	2.0
Sand	1.7-2.3	2.0
Sandstone	1.61-2.76	2.35
Shale	1.77-3.2	2.40
Limestone	1.93-2.90	2.55
Dolomite	2.28-2.90	2.70
Sedimentary rocks (av.)		2.50
Igneous rocks		
Rhyolite	2.35-2.70	2.52
Andesite	2.4-2.8	2.61
Granite	2.50-2.81	2.64
Granodiorite	2.67-2.79	2.73
Phorphyry	2.60-2.89	2.74
Quartz diorite	2.62-2.96	2.79
Diorite	2.72-2.99	2.85
Lavas	2.80-3.00	2.90
Diabase	2.50-3.20	2.91
Basalt	2.70-3.30	2.99
Gabbro	2.70-3.50	3.03
Peridotite	2.78-3.37	3.15
Acid igneous	2.30-3.11	2.61
Basic igneous	2.09-3.17	2.79
Metamorphic rocks		
Quartzite	2.5-2.70	2.60
Schists	2.39-2.9	2.64
Graywacke	2.6-2.7	2.65

DOI: https://doi.org/10.17509/wafi.xxxx
e- ISSN 2549-1989

Tipe Batuan	Rentang Densitas (g/cm^3)	Densitas Rata-rata (g/cm^3)
Marble	2.6-2.9	2.75
Serpentine	2.4-3.10	2.78
Slate	2.7-2.9	2.79
Gneiss	2.59-3.0	2.80
Amphibolite	2.90-3.04	2.96
Eclogile	3.2-3.54	3.37
Metamorphic	2.4-3.1	2.74

3. Hasil dan Pembahasan



Gambar 3. Delineasi Batas Cekungan dan Sub Cekungan Perairan Arafura

3.1. Interpretasi Kualitatif

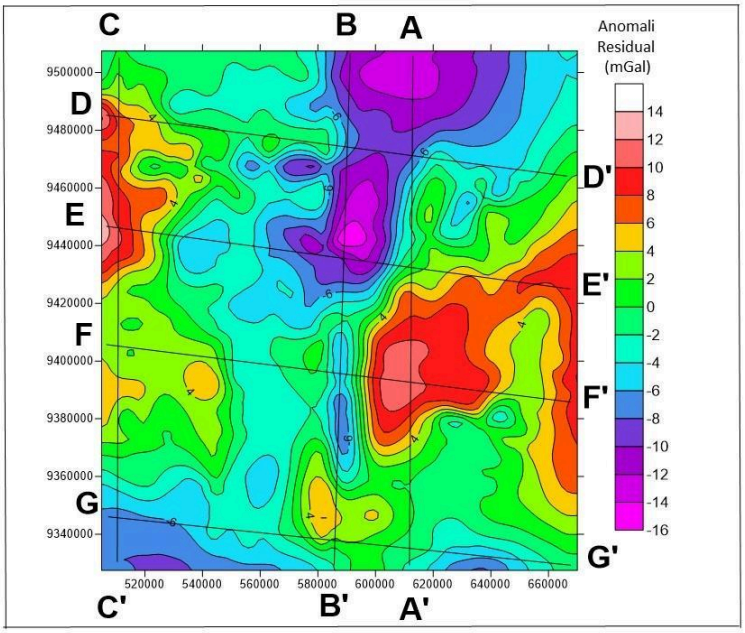
Dilakukan interpretasi kualitatif berdasarkan anomali residual dengan melakukan delineasi cekungan berupa penarikan batas cekungan dan batas sub cekungan. Anomali residual dengan depresi nilai anomali, diduga sebagai cekungan. Hasil delineasi berdasarkan anomali residual di Peraian Arafura ditunjukkan pada gambar 3.

Daerah yang diduga sebagai cekungan berada di utara mengarah ke barat daya. Sub cekungan nampak di daerah utara cekungan. Daerah cekungan terjadi karena kemungkinan adanya sedimentasi dari darat. Sedimen tersebut terendapkan dan terbawa dari Pulau Papua melalui aliran sungai yang mengarah ke laut. Delineasi ini menjadi faktor kemungkinan potensi hidrokarbon.

3.2. Interpretasi Kuantitatif

Interpretasi kuantitatif dilakukan pemodelan 2D *forward modelling* pada anomali residual untuk mengetahui struktur dan stratigrafi bawah permukaan pada wilayah penelitian. *Forward modelling* dilakukan untuk menghitung efek gaya berat model benda bawah permukaan dengan penampang berbentuk sembarang yang dapat diwakili oleh suatu poligon bersisi n dinyatakan sebagai integral garis sepanjang sisi-sisi poligon [5]. Dibuat tujuh lintasan, yaitu lintasan A-A’ hingga lintasan G-G’. Sayatan dilakukan pada daerah yang memiliki pertimbangan keberagaman

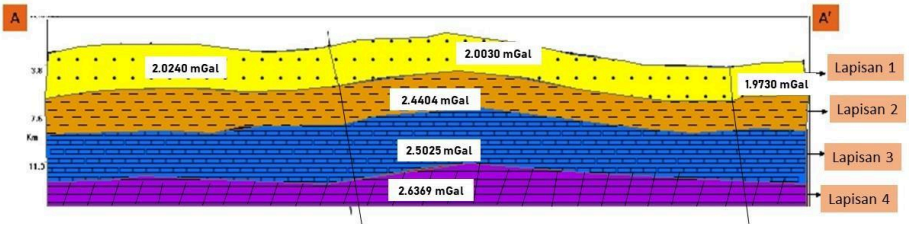
anomali untuk melihat perbedaannya. Ketujuh lintasan yang dibuat seperti pada gambar 4. berikut:



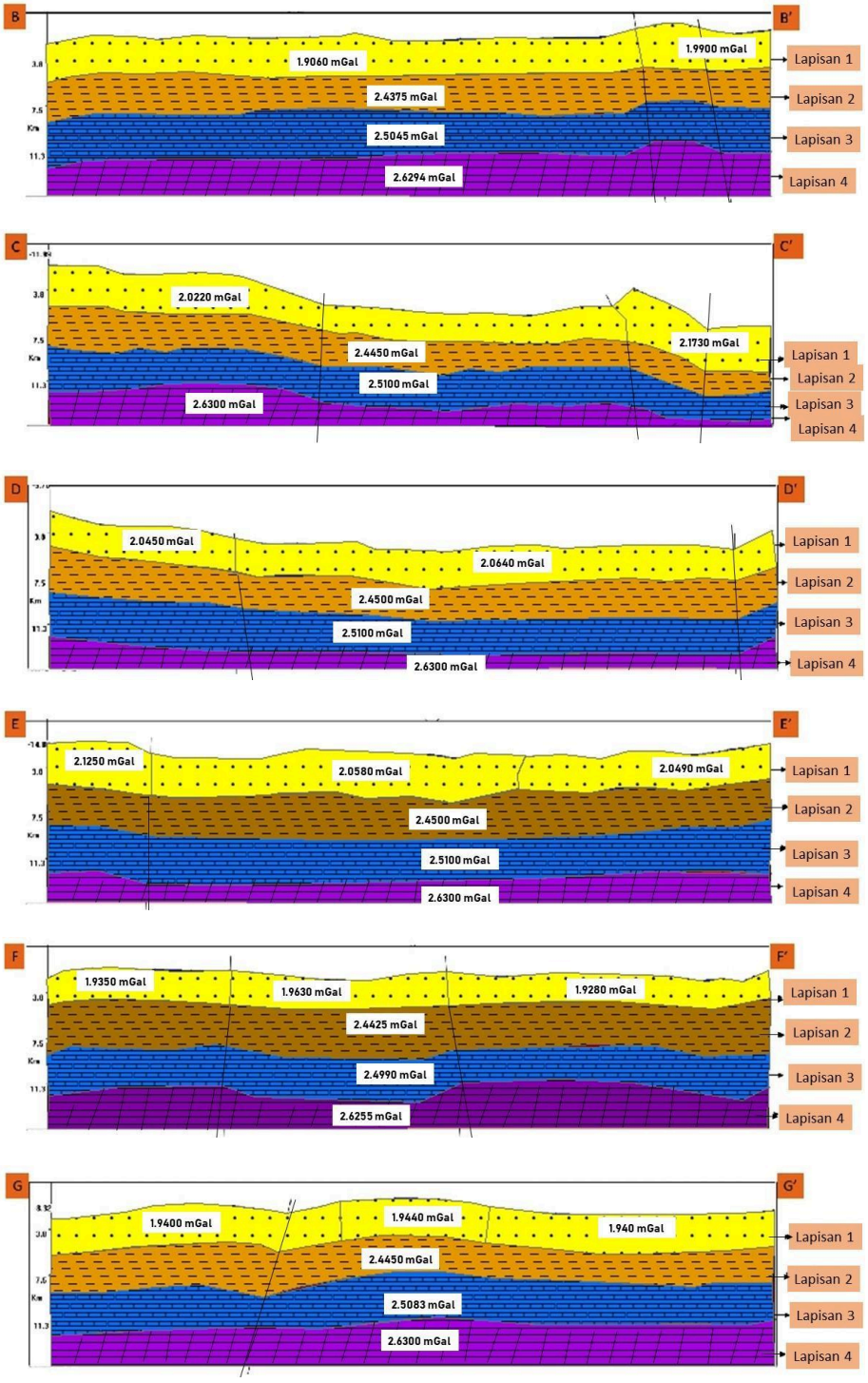
Gambar 4. Lintasan pada Anomali Residual untuk Pemodelan

Ketujuh sayatan lintasan tersebut dibuat menjadi pemodelan 2D yang akan menghasilkan nilai-nilai densitas pada setiap lapisannya. Penafsiran yang dilakukan berdasar pada validasi geologi nilai densitas pada tiap jenis batuan.

Lintasan A-A', B-B', dan C-C'berarah dari utara ke selatan. Lintasan D-D', E-E', F-F', dan G-G' berarah dari barat laut ke tenggara. Dari hasil sayatan tersebut ditemukan kecocokan pada pemodelan. Daerah yang memiliki anomali residual rendah menunjukkan rendahan atau daerah yang diduga sebagai cekungan, dan daerah yang memiliki anomali residual tinggi ditunjukkan sebagai daerah tinggian. Hasil penampang litologi bawah permukaan berdasarkan nilai densitasnya ditunjukkan pada gambar 5. Hasil pemodelan menunjukkan adanya 4 lapisan yang sama di setiap lintasan.



DOI: https://doi.org/10.17509/wafi.xxxx
e- ISSN 2549-1989



Gambar 5. Hasil Pemodelan 2D lintasan A-A' sampai G-G'

The results should be clear and concise. The results should summarize (scientific) findings rather than providing data in great detail. Please highlight the differences between your results or findings and the previous publications by other researchers. The discussion should explore the significance of the results of the

work, not repeat them. A combined Results and Discussion section is often appropriate. Avoid extensive citations and discussion of published literature.

In the discussion, it is the most important section of your article. Here you get the chance to sell your data. Make the discussion corresponding to the results, but do not reiterate the results. Often should begin with a brief summary of the main scientific findings (not experimental results).

The following important items should be covered in discussion:

How do your results relate to the original question or objectives outlined in the Introduction section? What is your finding of research? (what/how)?

Do you provide interpretation scientifically for each of your results or findings presented? This scientific interpretation must be supported by valid analysis and characterization (why)?

Are your results consistent with what other investigators have reported (what else)? Or are there any differences? Comparison your results with other researcher results is mandatory required..

4. Simpulan

Conclusions should only answer the objectives of the research. Tells how your work advances the field from the present state of knowledge. Without clear Conclusions, reviewers and readers will find it difficult to judge the work, and whether or not it merits publication in the journal. Do not repeat the Abstract, or just list experimental results. Provide a clear scientific justification for your work, and indicate possible applications and extensions. This conclusion should be provided as a paragraph. You should also suggest future experiments and/or point out those that are underway..

5. Ucapan Terima Kasih

Recognize those who helped in the research, especially funding source supporter (Funder of Research) of your research financially. If required, include individuals who have assisted you in your study: Advisors, Financial supporters, or may another supporter, i.e. Proofreaders, Typists, and Suppliers, who may have given materials. Do not acknowledge one of the authors' names.

Example of Funding Source Acknowledgement:

This work was supported by the National Institutes of Indonesia [grant numbers xxxx/yyyy]; and the University of Indonesia [grant number zzzz]..

6. Referensi

(*Cite the main scientific publications on which your work is based. Cite only items that you have read. Do not inflate the manuscript with too many references. Avoid excessive self-citations. Avoid excessive citations of publications from the same region. Check each reference against the original source (authors name, volume, issue, year, Digital Object Identification (DOI) Number). DOI Number information must be provided (if available). It is suggested to use Reference Manager Applications like EndNote, Mendeley, Zotero, etc. Use other published articles in the same journal as models. NOTE:* ***The minimum number of references should be 25 references, to make sure the adequacy of literatures cited, SAGE Vancouver bracket Style*****.)**

1. Marín-Buzón C, Pérez-Romero A, López-Castro JL, Jerbania I Ben, Manzano-Agugliaro F. Photogrammetry as a new scientific tool in archaeology: Worldwide research trends. Sustainability (Switzerland). 2021. doi:10.3390/su13095319
2. Briere D, Hurley P. Wireless Network Hacks & Mods. For Dummies. 2005. 387 p.
3. Choi J, Choi YY, Jeong JH, Baek I, Kim SH. Processing and Accuracy Assessment of MICROTOPS II Atmospheric Measurements for Absolute Radiometric Calibration of Optical Satellite Imagery. Korean Journal of Remote Sensing. 2026 Apr 30;42(2):181–96. doi:10.7780/KJRS.2026.42.2.2
4. (25 References minimally)