

THÔNG TIN VỀ LUẬN ÁN TIẾN SĨ

1. Họ và tên nghiên cứu sinh: Phạm Thành Luân
2. Giới tính: Nam
3. Ngày sinh: 03/04/1990
4. Nơi sinh: Nam Định
5. Quyết định công nhận nghiên cứu sinh: Số 2556/QĐ-ĐHKHTN ngày 26/07/2017 của Trường Đại học Khoa học Tự nhiên, Đại học Quốc gia Hà Nội.
6. Các thay đổi trong quá trình đào tạo: Không
7. Tên đề tài luận án: Nghiên cứu phát triển một số phương pháp mới trong công tác xử lý, phân tích số liệu trường thế.
8. Chuyên ngành: Vật lý địa cầu
9. Mã số: 9440130.06
10. Cán bộ hướng dẫn khoa học: Hướng dẫn chính: PGS.TS. Đỗ Đức Thanh
Hướng dẫn phụ: TS. Lê Huy Minh

11. Tóm tắt các kết quả mới của luận án:

Đã giới thiệu các phương pháp mới trong phân tích xử lý tài liệu từ và trọng lực, bao gồm:

- Phương pháp Logistic của gradient ngang toàn phần
- Phương pháp Logistic cải tiến
- Phương pháp Gradient ngang toàn phần được tăng cường
- Phương pháp Logistic của biên độ tín hiệu giải tích
- Phương pháp Tang hyperbolic và phương pháp Logistic khác của biên độ tín hiệu giải tích
- Phương pháp xác định vị trí cực đại cải tiến
- Phương pháp xác định ranh giới phân chia mật độ cải tiến
- Tổ hợp phương pháp xác định độ sâu bề trầm tích
- Phương pháp xác định ranh giới từ tính

12. Khả năng ứng dụng thực tiễn:

Các phương pháp được đề xuất có thể sử dụng trong nghiên cứu cấu trúc vỏ Trái đất, thăm dò và tìm kiếm khoáng sản.

13. Các hướng nghiên cứu tiếp theo:

Tiếp tục phát triển các phương pháp mới, hiệu quả hơn trong xử lý, phân tích tài liệu trường thế.

14. Các công trình công bố liên quan đến luận án:

[1] **Phạm Thanh Luân**, Do Duc Thanh (2017), “Estimation of sedimentary basin depth using the hybrid technique for gravity data”, *VNU Journal of Science: Mathematics – Physics* 33(2), 48-52.

- [2] **Luan Thanh Pham**, Erdinc Oksum, Thanh Duc Do (2018), “GCH_gravinv: A MATLAB-based program for inverting gravity anomalies over sedimentary basins”, *Computers & Geosciences* 120, 40–47.
- [3] **Pham Thanh Luan**, Le Huy Minh, Erdinc Oksum, Do Duc Thanh (2018), “Determination of maximum tilt angle from analytic signal amplitude of magnetic data by the curvature-based method”, *Vietnam Journal of Earth Sciences* 40(4), 354-366.
- [4] **Luan Thanh Pham**, Thanh Duc Do, Erdinc Oksum (2018), “A new method for edge detection in interpretation of potential field data”, *Journal of Engineering Sciences and Design* 6(4), 637-642.
- [5] **Luan Thanh Pham**, Erdinc Oksum, Thanh Duc Do, Le Huy Minh (2018), “New method for edges detection of magnetic sources using logistic function”, *Geofizicheskiy Zhurnal* 40(6), 127-135.
- [6] **Luan Thanh Pham**, Erdinc Oksum, Thanh Duc Do (2019), “Edge enhancement of potential field data using the logistic function and the total horizontal gradient”, *Acta Geodaetica et Geophysica*, 54, 143-155.
- [7] **Pham Thanh Luan**, Do Duc Thanh, Erdinc Oksum, Le Thi Sang (2019), “Estimation of Curie point depths in the Southern Vietnam continental shelf using magnetic data”, *Vietnam Journal of Earth Sciences* 41(3), 216-228.
- [8] **Luan Thanh Pham**, Erdinc Oksum, David Gómez-Ortiz, Thanh Duc Do (2019), “MagB_inv: A high performance Matlab program for estimating the magnetic basement relief by inverting magnetic anomalies”, *Computers & Geosciences* 134, 104347.
- [9] **Luan Thanh Pham**, Erdinc Oksum, Thanh Duc Do, Minh Le-Huy, Minh Duc Vu, Vinh Duc Nguyen (2019), “LAS: A combination of the analytic signal amplitude and the generalised logistic function as a novel edge enhancement of magnetic data”, *Contributions to Geophysics and Geodesy* 49 (4), 425-440.
- [10] Erdinc Oksum, Mustafa Nuri Dolmaz, **Luan Thanh Pham** (2019), “Inverting gravity anomalies over the Burdur sedimentary basin, SW Turkey”, *Acta Geodaetica et Geophysica* 54(4), 445–460.
- [11] Mustafa Nuri Dolmaz, Erdinc Oksum, **Luan Thanh Pham** (2019), “An Attempt to Depth Estimate and Boundaries of Burdur Sedimentary Basin, SW Turkey Using

Geophysical Methods”, *International Conferences on Science and Technology Engineering Science and Technology* (ICONST EST 2019).

[12] Pham Thanh Luan, Vu Duc Minh, Erdinc Oksum (2019), “Determination of Source Parameters of Simple-shaped Geologic Subsurface Structures from Self-potential Anomalies Using Enhanced Local Wavenumber Method”, *VNU Journal of Science: Mathematics – Physics* 35(1), 83-95.

[13] **Luan Thanh Pham**, Tich Van Vu, Sang Thi Le, Phuong Thi Trinh (2020), “Enhancement of potential field source boundaries using an improved logistic filter”, *Pure and Applied Geophysics* 177, 5237–524.

[14] **Luan Thanh Pham**, Erdinc Oksum, Thanh Duc Do, Minh Duc Vu (2020), “Comparison of different approaches of computing the tilt angle of the total horizontal gradient and tilt angle of the analytic signal amplitude for detecting source edges”. *Bulletin of the Mineral Research and Exploration*. DOI: 10.19111/bulletinofmre.746858.

[15] Ahmed Mohammed Eldosouky, **Luan Thanh Pham**, Hassan Mohammed, Biswajeet Pradhan (2020), “A comparative study of THG, AS, TA, Theta, TDX and LTHG techniques for improving source boundaries detection of magnetic data using synthetic models: a case study from G. Um Monqul, North Eastern Desert, Egypt”, *Journal of African Earth Sciences* 170, 103940.

[16] **Luan Thanh Pham** (2020), “A comparative study on different methods for calculating gravity effect of an uneven layer: Application to computation of Bouguer gravity anomaly in the East Vietnam Sea and adjacent areas”, *VNU Journal of Science: Mathematics – Physics* 36(3), 106-114.

[17] **Luan Thanh Pham** (2020), “A comparative study on different filters for enhancing potential field source boundaries: synthetic examples and a case study from the Song Hong Trough (Vietnam)”, *Arabian Journal of Geosciences* 13, 723.

[18] **Luan Thanh Pham**, Ahmed Mohammed Eldosouky, Erdinc Oksum, Saada Ahmed Saada (2020), “A new high resolution filter for source edge detection of potential data”, *Geocarto International*. DOI: 10.1080/10106049.2020.1849414.

[19] **Luan Thanh Pham**, Erdinc Oksum, Thanh Doc Do, Dat Viet Nguyen, Ahmed Mohammed Eldosouky (2020), “On the performance of phase-based filters for enhancing lateral boundaries of magnetic and gravity sources: a case study of the Seattle Uplift”, *Arabian Journal of Geosciences* (Đã nhận đăng)

[20] Erdinc Oksum, Dung Van Le, Minh Duc Vu, Thu-Hang Thi Nguyen, **Luan Thanh Pham*** (2020), “A novel approach based on the fast sigmoid function for interpretation of potential field data”, *Bollettino di Geofisica Teorica ed Applicata* (Đã nhận đăng).

Ngày 13 tháng 11 năm 2020

Người hướng dẫn luận án

Nghiên cứu sinh

PGS. TS. Đỗ Đức Thanh

Phạm Thành Luân

TS. Lê Huy Minh

INFORMATION ON DOCTORAL THESIS

1. Full name: Pham Thanh Luan

2. Sex: Male

3. Date of birth: 03/04/1990

4. Place of birth: Nam Dinh

5. Admission decision number:

6. Changes in academic process: No

7. Official thesis title: Research and application of improved methods for interpreting potential filed data from Vietnam

8. Major: Physics of the Earth

9. Code: 9440130.06

10. Supervisors:

The principal supervisor: Assoc.Prof. Dr. Do Duc Thanh

The second supervisor Dr. Le Huy Minh

11. Summary of the new findings of the thesis

Some new methods have been introduced for interpretation of gravity and magnetic data:

- Logistic of the total horizontal gradient
- Improved Logistic
- Enhanced total horizontal gradient
- Logistic of the analytic signal
- Hyperbolic tangent and another logistic of the analytic signal
- Improved method for detecting maximum location detection
- Improved method for determining depth of density interface
- Determining depth of sedimentary basin
- Determining depth of magnetization interface

12. Paratical applicability, if any:

The proposed methods can be used in study on the structure of the crust, search for minerals.

13. Further research directions, if any

Developing new methods for interpreting gravity and magnetic data.

14. Thesis-related publications:

- [1] **Pham Thanh Luan**, Do Duc Thanh (2017), “Estimation of sedimentary basin depth using the hybrid technique for gravity data”, *VNU Journal of Science: Mathematics – Physics* 33(2), 48-52.
- [2] **Luan Thanh Pham**, Erdinc Oksum, Thanh Duc Do (2018), “GCH_gravinv: A MATLAB-based program for inverting gravity anomalies over sedimentary basins”, *Computers & Geosciences* 120, 40–47.
- [3] **Pham Thanh Luan**, Le Huy Minh, Erdinc Oksum, Do Duc Thanh (2018), “Determination of maximum tilt angle from analytic signal amplitude of magnetic data by the curvature-based method”, *Vietnam Journal of Earth Sciences* 40(4), 354-366.
- [4] **Luan Thanh Pham**, Thanh Duc Do, Erdinc Oksum (2018), “A new method for edge detection in interpretation of potential field data”, *Journal of Engineering Sciences and Design* 6(4), 637-642.
- [5] **Luan Thanh Pham**, Erdinc Oksum, Thanh Duc Do, Le Huy Minh (2018), “New method for edges detection of magnetic sources using logistic function”, *Geofizicheskiy Zhurnal* 40(6), 127-135.
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- [7] **Pham Thanh Luan**, Do Duc Thanh, Erdinc Oksum, Le Thi Sang (2019), “Estimation of Curie point depths in the Southern Vietnam continental shelf using magnetic data”, *Vietnam Journal of Earth Sciences* 41(3), 216-228.
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- [9] **Luan Thanh Pham**, Erdinc Oksum, Thanh Duc Do, Minh Le-Huy, Minh Duc Vu, Vinh Duc Nguyen (2019), “LAS: A combination of the analytic signal amplitude and the generalised logistic function as a novel edge enhancement of magnetic data”, *Contributions to Geophysics and Geodesy* 49 (4), 425-440.

- [10] Erdinc Oksum, Mustafa Nuri Dolmaz, **Luan Thanh Pham** (2019), “Inverting gravity anomalies over the Burdur sedimentary basin, SW Turkey”, *Acta Geodaetica et Geophysica* 54(4), 445–460.
- [11] Mustafa Nuri Dolmaz, Erdinc Oksum, **Luan Thanh Pham** (2019), “An Attempt to Depth Estimate and Boundaries of Burdur Sedimentary Basin, SW Turkey Using Geophysical Methods”, *International Conferences on Science and Technology Engineering Science and Technology* (ICONST EST 2019).
- [12] Pham Thanh Luan, Vu Duc Minh, Erdinc Oksum (2019), “Determination of Source Parameters of Simple-shaped Geologic Subsurface Structures from Self-potential Anomalies Using Enhanced Local Wavenumber Method”, *VNU Journal of Science: Mathematics – Physics* 35(1), 83-95.
- [13] **Luan Thanh Pham**, Tich Van Vu, Sang Thi Le, Phuong Thi Trinh (2020), “Enhancement of potential field source boundaries using an improved logistic filter”, *Pure and Applied Geophysics* 177, 5237–524.
- [14] **Luan Thanh Pham**, Erdinc Oksum, Thanh Duc Do, Minh Duc Vu (2020), “Comparison of different approaches of computing the tilt angle of the total horizontal gradient and tilt angle of the analytic signal amplitude for detecting source edges”. *Bulletin of the Mineral Research and Exploration*. DOI: 10.19111/bulletinofmre.746858.
- [15] Ahmed Mohammed Eldosouky, **Luan Thanh Pham**, Hassan Mohammed, Biswajeet Pradhan (2020), “A comparative study of THG, AS, TA, Theta, TDX and LTHG techniques for improving source boundaries detection of magnetic data using synthetic models: a case study from G. Um Monqul, North Eastern Desert, Egypt”, *Journal of African Earth Sciences* 170, 103940.
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[17] **Luan Thanh Pham** (2020), “A comparative study on different filters for enhancing potential field source boundaries: synthetic examples and a case study from the Song Hong Trough (Vietnam)”, *Arabian Journal of Geosciences* 13, 723.

[18] **Luan Thanh Pham**, Ahmed Mohammed Eldosouky, Erdinc Oksum, Saada Ahmed Saada (2020), “A new high resolution filter for source edge detection of potential data”, *Geocarto International*. DOI: 10.1080/10106049.2020.1849414.

[19] **Luan Thanh Pham**, Erdinc Oksum, Thanh Doc Do, Dat Viet Nguyen, Ahmed Mohammed Eldosouky (2020), “On the performance of phase-based filters for enhancing lateral boundaries of magnetic and gravity sources: a case study of the Seattle Uplift”, *Arabian Journal of Geosciences* (Accepted)

[20] Erdinc Oksum, Dung Van Le, Minh Duc Vu, Thu-Hang Thi Nguyen, **Luan Thanh Pham*** (2020), “A novel approach based on the fast sigmoid function for interpretation of potential field data”, *Bollettino di Geofisica Teorica ed Applicata* (Accepted)

Date: November 13, 2020

Supervisor

PhD Student

Assoc.Prof.Dr. Do Duc Thanh

Pham Thanh Luan

Dr. Le Huy Minh