CONTACT INFORMATION

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OVERVIEW

Full Professor at the geophysics department of Observatório Nacional, Brazil. Specialist in numerical methods for processing and interpreting potential fields (gravity and magnetic).

APPOINTMENTS

Full Professor of Geophysics
Observatório Nacional, Brazil 2020–present

Associate Professor of Geophysics
Observatório Nacional, Brazil 2016–2020

Assistant Professor of Geophysics
Observatório Nacional, Brazil 2013–2016

RESEARCH INTERESTS

- **Equivalent layer technique:** computationally efficient methods for processing and interpreting large potential field data sets.
- **Inversion of gravity and/or magnetic data:** methods to invert gravity and/or magnetic data for the purpose of estimating the position and shape of geological bodies.
- **Magnetization of geological bodies:** methods for estimating the magnetization direction of geological bodies by using land and airborne magnetic data.
- **Magnetization of rock samples:** methods for estimating the magnetization distribution within rock samples by using scanning magnetic microscopy data.
- **Magnetic modeling of geological bodies:** methods for computing the demagnetizing field within geological bodies having high susceptibility.

- **Regional characterization of gravity field:** computationally efficient methods for representing the regional gravity field by combining different data sets.
- **Regional characterization of the crustal magnetic field:** computationally efficient methods for representing the crustal field by combining different data sets.

EDUCATION

PhD Geophysics

Observatório Nacional, Brazil Dec/2010 – Jan/2013

Title (portuguese): *Processamento e inversão de dados de campos potenciais: novas abordagens*
Title (english): *Processing and inversion of potential field data: new approaches*
Advisor: Dr. Valéria C. F. Barbosa
Description: This work presents two new methodologies for processing and interpreting potential field data. The first one is the Polynomial Equivalent Layer, which is a cost-effective method for processing large potential-field data sets via the equivalent-layer technique. The second is a non-linear method for inverting gravity-gradient data to estimate the shape of isolated 3-D geological bodies.
`doi:` `10.6084/m9.figshare.20334651.v1`

MSc Geophysics

Observatório Nacional, Brazil Mar/2009 – Nov/2010

Title (portuguese): *Inversão gravimétrica radial por camadas para a reconstrução de corpos geológicos 3D*
Title (english): *Radial gravity inversion by layers for retrieving 3D geological bodies*
Advisor: Dr. Valéria C. F. Barbosa
Description: This work presents a gravity-inversion method for estimating the geometry of a 3D source. The subsurface region containing the geologic source is discretized into an ensemble of vertically juxtaposed prisms. By estimating the coordinates of the horizontal section of each prism, the method retrieves a set of polygonal horizontal sections representing depth slices of the 3D gravity source.
`doi:10.6084/m9.figshare.20334531.v1`

BSc Geophysics

University of São Paulo, Brazil Mar/2004 – Dec/2008

Title (portuguese): *Modelagem gravimétrica 3D da borda norte da Bacia do Paraná*
Title (english): *3D gravity modelling of the northern border of the Paraná basin*
Advisor: Dr. Yára R. Marangoni
Description: This work presents a geological model of the northern border of the Paraná basin obtained from gravity data.

PEER-REVIEWED JOURNAL PAPERS (ORCID)

(1) D. Takahashi, V. C. Oliveira Jr., and V. C. F. Barbosa. Convolutional equivalent layer for magnetic data processing. *Geophysics*, just accepted(XXX):1–59, 2022. URL https://doi.org/10.1190/geo2021-0599.1

(2) S. P. Gonzalez, V. C. F. Barbosa, and V. C. Oliveira Jr. Analyzing the ambiguity of the remanent-magnetization direction separated into induced and remanent magnetic sources. *Journal of Geophysical Research: Solid Earth*, 127(6):e2022JB024151, 2022. URL https://doi.org/10.1029/2022JB024151

(3) L. B. Vital, V. C. Oliveira Jr., and V. C. F. Barbosa. Magnetic radial inversion for 3-D source geometry estimation. *Geophysical Journal International*, 05 2021. ISSN 0956-540X. URL https://doi.org/10.1093/gji/ggab195

(4) F. F. Melo, S. P. Gonzalez, V. C. Barbosa, and V. C. Oliveira Jr. Amplitude of the magnetic anomaly vector in the interpretation of total-field anomaly at low magnetic latitudes. *Journal of Applied Geophysics*, 190:104339, 2021. ISSN 0926-9851. URL https://doi.org/10.1016/j.jappgeo.2021.104339

(5) M. C. Hidalgo-Gato, V. C. F. Barbosa, and V. C. Oliveira Jr. Magnetic amplitude inversion for depth-to-basement and apparent magnetization-intensity estimates. *Geophysics*, 86(1):J1–J11, 2021. URL https://doi.org/10.1190/geo2019-0726.1

(6) D. Takahashi, V. C. Oliveira Jr., and V. C. F. Barbosa. Convolutional equivalent layer for gravity data processing. *Geophysics*, 85(6):G129–G141, 2020. URL https://doi.org/10.1190/geo2019-0826.1

(7) A. L. A. Reis, V. C. Oliveira Jr., and V. C. F. Barbosa. Generalized positivity constraint on magnetic equivalent layers. *Geophysics*, 85(6):J99–J110, 2020. URL https://doi.org/10.1190/geo2019-0706.1

(8) V. P. Maurya, S. L. Fontes, V. C. Oliveira Jr., and E. F. La Terra. Gradient based first- and second-order filters for the demarcation of continental-oceanic boundaries using satellite gravity data. *Geophysical Journal International*, 221(3):1499–1514, 02 2020. ISSN 0956-540X. URL https://doi.org/10.1093/gji/ggaa084

(9) B. M. S. Bastos and V. C. Oliveira Jr. Isostatic constraint for 2D nonlinear gravity inversion on rifted margins. *Geophysics*, 85(1):G17–G34, 2020. URL https://doi.org/10.1190/geo2018-0772.1

(10) J. F. D. F. Araujo, A. L. A. Reis, A. A. P. Correa, E. Yokoyama, V. C. Oliveira Jr., L. A. F. Mendoza, M. A. C. Pacheco, C. Luz-Lima, A. F. Santos, F. G. Osorio G., G. E. Brito, W. W. R. Araujo, Tahir, A. C. Bruno, and T. Del Rosso. Scanning magnetic microscope using a gradiometric configuration for characterization of rock samples. *Materials*, 12(24), 2019. ISSN 1996-1944. URL https://doi.org/10.3390/ma12244154

(11) J. F. D. F. Araujo, A. L. A. Reis, V. C. Oliveira Jr., A. F. Santos, C. Luz-Lima, E. Yokoyama, L. A. F. Mendoza, J. M. B. Pereira, and A. C. Bruno. Characterizing complex mineral structures in thin sections of geological samples with a scanning hall

effect microscope. *Sensors*, 19(7), 2019. ISSN 1424-8220. URL https://doi.org/10.3390/s19071636

(12) D. Takahashi and V. C. Oliveira Jr. Ellipsoids (v1.0): 3-D magnetic modelling of ellipsoidal bodies. *Geoscientific Model Development*, 10(9):3591–3608, 2017. URL https://doi.org/10.5194/gmd-10-3591-2017

(13) F. C. L. Siqueira, V. C. Oliveira Jr., and V. C. F. Barbosa. Fast iterative equivalent-layer technique for gravity data processing: A method grounded on excess mass constraint. *Geophysics*, 82(4):G57–G69, 2017. URL https://doi.org/10.1190/geo2016-0332.1

(14) A. L. A. Reis, V. C. Oliveira Jr., E. Yokoyama, A. C. Bruno, and J. M. B. Pereira. Estimating the magnetization distribution within rectangular rock samples. *Geochemistry, Geophysics, Geosystems*, 17(8):3350–3374, 2016. URL https://doi.org/10.1002/2016GC006329

(15) V. C. Oliveira Jr., D. P. Sales, V. C. F. Barbosa, and L. Uieda. Estimation of the total magnetization direction of approximately spherical bodies. *Nonlinear Processes in Geophysics*, 22(2):215–232, 2015. URL https://doi.org/10.5194/npg-22-215-2015

(16) L. Uieda, V. C. Oliveira Jr., and V. C. F. Barbosa. Geophysical tutorial: Euler deconvolution of potential-field data. *The Leading Edge*, 33(4):448–450, 2014. URL https://doi.org/10.1190/tle33040448.1

(17) V. C. Oliveira Jr., V. C. F. Barbosa, and L. Uieda. Polynomial equivalent layer. *Geophysics*, 78(1):G1–G13, 2013. URL https://doi.org/10.1190/geo2012-0196.1

(18) F. F. Melo, V. C. F. Barbosa, L. Uieda, V. C. Oliveira Jr., and J. B. C. Silva. Estimating the nature and the horizontal and vertical positions of 3D magnetic sources using Euler deconvolution. *Geophysics*, 78(6):J87–J98, 2013. URL https://doi.org/10.1190/geo2012-0515.1

(19) V. C. Oliveira Jr. and V. C. Barbosa. 3-D radial gravity gradient inversion . *Geophysical Journal International*, 195(2):883–902, 09 2013. ISSN 0956-540X. URL https://doi.org/10.1093/gji/ggt307

(20) V. C. Oliveira Jr., V. C. F. Barbosa, and J. B. C. Silva. Source geometry estimation using the mass excess criterion to constrain 3-D radial inversion of gravity data. *Geophysical Journal International*, 187(2):754–772, 11 2011. ISSN 0956-540X. URL https://doi.org/10.1111/j.1365-246X.2011.05172.x

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INTERNATIONAL CONFERENCES

(1) S. P. Gonzalez, V. C. F.Barbosa, and V. C. Oliveira Jr. Estimate of the remanent magnetization direction via equivalent layer. In *SEG Technical Program Expanded Abstracts 2020*, pages 969–973. SEG, 2020. URL https://doi.org/10.1190/segam2020-3428268.1. [abstract co-author]

(2) L. S. Piauilino, V. C. F.Barbosa, and V. C. Oliveira Jr. Fast equivalent-layer technique for magnetic data processing. In *SEG Technical Program Expanded Abstracts 2020*, pages 930–934. SEG, 2020. URL https://doi.org/10.1190/segam2020-3428252.1. [abstract co-author]

(3) D. Takahashi, V. C. Oliveira Jr., and V. C. F.Barbosa. Gravity data processing with a convolutional equivalent layer. In *SEG Technical Program Expanded Abstracts 2020*, pages 935–939. SEG, 2020. URL https://doi.org/10.1190/segam2020-3426849.1. [abstract co-author]

(4) F. F. Melo, S. P. Gonzalez, V. C. F.Barbosa, and V. C. Oliveira Jr. Amplitude of the magnetic anomaly vector for interpretation at low latitudes. In *SEG Technical Program Expanded Abstracts 2019*, pages 1744–1748, San Antonio, USA, 2019. SEG. URL https://doi.org/10.1190/segam2019-3215222.1. [abstract co-author]

(5) S. P. Gonzalez, F. F. Melo, V. C. F.Barbosa, and V. C. Oliveira Jr. Amplitude of the magnetic anomaly vector in low latitudes via equivalent layer. In *16th International Congress of the Brazilian Geophysical Society*, pages 1–6, Rio de Janeiro, Brazil, 2019. SBGF. URL https://doi.org/10.22564/16cisbgf2019.028. [abstract co-author]

(6) A. L. A. Reis, V. C. F.Barbosa, and V. C. Oliveira Jr. Equivalent layer technique for estimating magnetization direction. In *SEG Technical Program Expanded Abstracts 2019*, pages 1769–1773, San Antonio, USA, 2019. SEG. URL https://doi.org/10.1190/segam2019-3216745.1. [abstract co-author]

(7) L. S. Piauilino, V. C. F.Barbosa, and V. C. Oliveira Jr. Estimative of the gravity-gradient data from vertical component of gravitational attraction by using the equivalent-layer and fast fourier transform techniques. In *16th International Congress of the Brazilian Geophysical Society*, pages 1–6, Rio de Janeiro, Brazil, 2019. SBGF. URL https://doi.org/10.22564/16cisbgf2019.235. [abstract co-author]

(8) L. S. Piauilino, V. C. F.Barbosa, and V. C. Oliveira Jr. Estimative of gravity-gradient tensor components via fast iterative equivalent-layer technique. In *SEG Technical Program Expanded Abstracts 2019*, pages 1769–1773, San Antonio, USA, 2019. SEG. URL https://doi.org/10.1190/segam2019-3215804.1. [abstract co-author]

(9) L. B. Vital, V. C. Oliveira Jr., and V. C. F. Barbosa. Radial magnetic inversion to retrieve the geometry of 3d sources. In *SEG Technical Program Expanded Abstracts 2019*, pages 1754–1758. SEG, 2019. URL https://doi.org/10.1190/segam2019-3215805.1. [abstract co-author]

(10) L. B. Vital, C. Foss, V. C. Oliveira Jr., and V. C. F. Barbosa. Magnetic field inversion – the cost of freedom. In *2nd Australian Exploration Geoscience Conference: From Data to Discovery*, volume 2019, pages 1–5. ASEG, Taylor & Francis, 2019. URL https://doi.org/10.1080/22020586.2019.12073182. [abstract co-author]

(11) A. D. Arelaro, V. C. F.Barbosa, and V. C. Oliveira Jr. The sensitivity of ocean-bottom gravimeters at deep waters to mass changes in a synthetic hydrocarbon reservoir. In *16th International Congress of the Brazilian Geophysical Society*, pages 1–6, Rio de Janeiro, Brazil, 2019. SBGF. URL https://doi.org/10.22564/16cisbgf2019.242. [abstract co-author]

(12) F. C. L. Siqueira, V. C. F.Barbosa, and V. C. Oliveira Jr. Iterative fast equivalent-layer technique. In *79th EAGE Conference and Exhibition 2017*, pages 1–5, Paris, France, 2017. European Association of Geoscientists & Engineers. URL https://doi.org/10.3997/2214-4609.201701077. [abstract co-author]

(13) A. L. A. Reis and V. C. Oliveira Jr. Sed for optimal acquisition design and sensor-to-sample distance applied to scanning magnetic microscopy. In *Fifth bi-anual meeting of the LATINMAG*, Querétaro, México, 2017. LATINMAG. URL https://www.geofisica.unam.mx/LatinmagLetters/LL17-01-SP/MR/MR05.pdf. [abstract co-author]

(14) D. Takahashi and V. C. Oliveira Jr. Modelagem magnética de fontes elipsoidais. In *VII Simpósio Brasileiro de Geofísica*, pages 1–5, Ouro Preto, Brazil, 2016. SBGF. URL https://doi.org/10.22564/7simbgf2016.030. [attendee, abstract co-author]

(15) A. L. A. Reis and V. C. Oliveira Jr. Impact of the sensor area, acquisition design and position noise on the estimation of the magnetization distribution within a rectangular rock sample. In *2016 AGU Fall Meeting*, San Francisco, USA, 2016. AGU. URL https://ui.adsabs.harvard.edu/abs/2016AGUFMGP31A1286R/abstract. [attendee, abstract co-author]

(16) K. A. T. Hallam and V. C. Oliveira Jr. Applications of differential operators in geodetic coordinates. In *2016 AGU Fall Meeting*, San Francisco, USA, 2016. AGU. URL https://ui.adsabs.harvard.edu/abs/2016AGUFM.G41A1011H/abstract. [attendee, abstract co-author]

(17) V. C. Oliveira Jr., D. P. Sales, V. C. F. Barbosa, and L. Uieda. Estimating the total magnetization direction of approximately spherical bodies. In *26th IUGG General Assembly - IAGA - A41 Lithospheric Field Modeling, the WDMAM and Tectonic Implications (Div. V) - A41p-280*, Prague, Czech Republic, 2015. IUGG. [attendee, abstract co-author, poster presenter]

(18) A. L. A. Reis, V. C. Oliveira Jr., E. Yokoyama, A. C. Bruno, and J. M. B. Pereira. Estimating the magnetization distribution within rectangular rock samples. In *26th IUGG General Assembly - IAGA - A06d-A06d A06/A07 Applied Rock Magnetism (Div. I) / Theoretical and Experimental Rock Magnetism (Div. I) - IUGG-1853*, Prague, Czech Republic, 2015. IUGG. [attendee, abstract co-author, oral presenter]

(19) V. C. Oliveira Jr. and V. C. F. Barbosa. 3-D radial gravity gradient inversion applied to the interpretation of the Vinton Salt Dome, USA. In *76th EAGE Conference and Exhibition 2014*, Amsterdam, Netherlands, 2014. EAGE. URL https://doi.org/10.3997/2214-4609.20141552. [attendee, expanded abstract author, oral presenter]

(20) L. Uieda, V. C. Oliveira Jr., and V. C. F. Barbosa. Modeling the Earth with Fatiando a Terra. In *12th Scientific Computing with Python Conference*, Austin, USA, 2013. SciPy. URL https://conference.scipy.org/proceedings/scipy2013/pdfs/uieda.pdf. [expanded abstract co-author]

(21) V. C. Oliveira Jr. and V. C. F. Barbosa. Polynomial equivalent layer. In *SEG Las Vegas 2012 Annual Meeting*, Las Vegas, USA, 2012. SEG. URL https://doi.org/10.1190/segam2012-0091.1. [expanded abstract author]

(22) V. C. Oliveira Jr. and V. C. F. Barbosa. 3D radial inversion of gravity data for estimating the source's geometry. In *73rd EAGE Conference and Exhibition incorporating SPE EUROPEC 2011*, Vienna, Austria, 2011. EAGE. URL https://doi.org/10.3997/2214-4609.20149568. [attendee, expanded abstract author, oral presentation]

(23) V. C. Oliveira Jr. and V. C. F. Barbosa. Radial gravity inversion constrained by total anomalous mass excess for retrieving 3D bodies. In *SEG San Antonio 2011 Annual Meeting*, San Antonio, USA, 2011. SEG. URL https://doi.org/10.1190/1.3628197. [expanded abstract author]

THESES SUPERVISED

(1) **[PhD]** Title (portuguese): *Camada equivalente convolucional para processamento de dados potenciais*, Title (english): *Convolutional equivalent ayer for potential-field data processing*, Author: Diego Takahashi, *Observatório Nacional, Brazil* (2021). **doi:** 10.6084/m9.figshare.20335446.v1

(2) **[PhD]** Title (portuguese): *Inversão magnética radial robusta para estimar a geometria de fontes 3D*, Title (english): *Robust radial magnetic inversion for estimating the geometry of 3D sources*, Author: Leonardo B. Vital, *Observatório Nacional, Brazil* (2020). **doi:** 10.6084/m9.figshare.20335326.v1

(3) **[PhD]** Title (portuguese): *Desenvolvimentos teóricos da camada equivalente e suas aplicações a dados magnéticos*, Title (english): *Theoretical developments of equivalent layer and its applications to magnetic data*, Author: André L. A. Reis, *Observatório Nacional, Brazil* (2020). **doi:** 10.6084/m9.figshare.20335287.v1

(4) **[PhD]** Title (portuguese): *Modelagem regional do campo de gravidade utilizando pontos de massa em coordenadas geodésicas*, Title (english): *Regional gravity modeling by using point masses in geodetic coordinates*, Author: Kristoffer A. T. Hallam, *Observatório Nacional, Brazil* (2019). **doi:** 10.6084/m9.figshare.20335266.v1

(5) **[MSc]** Title (portuguese): *Inversão gravimétrica 2D com vínculo isostático*, Title (english): *2D gravity inversion with isostatic constraint*, Author: B. Marcela S. Bastos, *Observatório Nacional, Brazil* (2018). **doi:** 10.6084/m9.figshare.20335263.v1

(6) **[MSc]** Title (portuguese): *Modelagem magnética 3D de corpos elipsoidais*, Title (english): *3D Magnetic modeling of elipsoidal bodies*, Author: Diego Takahashi, *Observatório Nacional, Brazil* (2017). **doi:** 10.6084/m9.figshare.20335221.v1

(7) **[MSc]** Title (portuguese): *Inversão magnética 3D para estimar a distribuição de magnetização de uma amostra de rocha*, Title (english): *3D Magnetic inversion to estimate the magnetization distribution of a rectangular rock sample*, Author: André L. A. Reis, *Observatório Nacional, Brazil* (2016). **doi:** 10.6084/m9.figshare.20335209.v1

(8) **[MSc]** Title (portuguese): *Estimativa do vetor de magnetização total de corpos aproximadamente esféricos*, Title (english): *Estimating the total magnetization vector of approximately spherical bodies*, Author: Daiana P. Sales, *Observatório Nacional, Brazil* (2014). **doi:** 10.6084/m9.figshare.20334867.v1

THESES CO-SUPERVISED

(1) **[MSc]** Title (portuguese): *Análise de sensibilidade de aquisição gravimétrica 4D de fundo oceânico*, Title (english): *Sensitivity analysis of 4D gravity survey at ocean bottom*, Author: André D. Arelaro, *Observatório Nacional, Brazil* (2020). **doi:** 10.6084/m9.figshare.20339034.v1

(2) **[PhD]** Title (portuguese): *Métodos de inversão de dados magnéticos para estimar fontes regionais*, Title (english): *Magnetic data inversion methods for estimating regional sources*, Author: Marlon C. Hidalgo-Gato, *Observatório Nacional, Brazil* (2019). doi: 10.6084/m9.figshare.20339082.v1

(3) **[MSc]** Title (french): *Modélisation numérique des anomalies magnétiques au niveau de la zone de fracture de Saint Paul*, Title (english): *Numerical modeling of magnetic anomalies anomalies over the Saint Paul fracture zone*, Author: Line Colin, *Institut Universitaire Européen de la Mer (IUEM), France* (2019). doi: 10.6084/m9.figshare.20341056.v1

(4) **[MSc]** Title (portuguese): *Investigação geofísica do Alto do Ceará na margem equatorial brasileira – Uma crosta continental ou uma crosta oceânica?*, Title (english): *Geophysical investigation of the Ceará Rise in the brazilian equatorial margin – A continental crust or oceanic crust?*, Author: Victor C. Pereira, *Observatório Nacional, Brazil* (2017). doi: 10.6084/m9.figshare.20340885.v1

(5) **[PhD]** Title (portuguese): *Otimização computacional do método da camada equivalente*, Title (english): *Computational optimization of the equivalent layer method*, Author: Fillipe C. L. Siqueira, *Observatório Nacional, Brazil* (2016). doi: 10.6084/m9.figshare.20340975.v1

CURRENT STUDENTS

(1) **PhD** co- supervisor of Shayane P. Gonzalez — since Apr/2018
Observatório Nacional, Brazil

(2) **PhD** co- supervisor of Larissa S. Piauilino — since Jul/2018
Observatório Nacional, Brazil

(3) **MSc** main supervisor of Edson F. Luza — since Mar/2020
Observatório Nacional, Brazil

(4) **MSc** main supervisor of Raimundo O. Sousa Jr — since Sep/2020
Observatório Nacional, Brazil

(5) **PhD** co- supervisor of India Uppal — since Nov/2021
University of Liverpool, UK

TEACHING

Potential-field methods — 2014–present
https://github.com/birocoles/Disciplina-metodos-potenciais
Graduate Program in Geophysics, Observatório Nacional, Brazil

Computational methods applied to Geophysics — 2014–present
https://github.com/birocoles/Disciplina-metodos-computacionais
Graduate Program in Geophysics, Observatório Nacional, Brazil

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PARTICIPATION IN DEPARTMENTAL COMMITTEES

Member of the Graduate Program in Geophysics Committee *Observatório Nacional, Brazil*	2020–present
Member of the Faculty Staff of the Graduate Program in Geophysics *Observatório Nacional, Brazil*	2014–present
Head of the Graduate Program in Geophysics Committee *Observatório Nacional, Brazil*	2017–2018
Member of the Graduate Program in Geophysics Committee *Observatório Nacional, Brazil*	2014–2018

FUNDING

(1) Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Title (portuguese): *Interpretação de dados magnéticos produzidos por distribuições de magnetização heterogêneas*, Title (english): *Interpretation of magnetic data produced by heterogeneous magnetization distributions*, ID: 315768/2020-7, Research grant: CNPq N° 09/2020 - Bolsas de Produtividade em Pesquisa - PQ, R$ 79 200.00, Mar/2021 – Feb/2024.

(2) Fundação Carlos Chagas Filho de Amparo à Pesquisa do Estado do Rio de Janeiro (FAPERJ), Title (portuguese): *Camada equivalente aplicada à caracterização magnética de feições estruturais em regiões de crosta oceânica próximas ao equador*, Title (english): *Equivalent layer applied to magnetic characterization of structural features on ocean crust at regions close to equator*, ID: E-26/202.729/2018, Research grant: Jovem Cientista do Nosso Estado – JCNE/2018, R$ 75 600.00, Nov/2018 – Out/2021.

(3) Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Title (portuguese): *Camada equivalente aplicada ao processamento de dados magnéticos*, Title (english): *Equivalent layer applied to magnetic data processing*, ID: 308945/2017-4, Research grant: CNPq N° 12/2017 - Bolsas de Produtividade em Pesquisa - PQ, R$ 39 600.00, Mar/2018 – Feb/2021.

(4) Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Title (portuguese): *Estimativa da direção da magnetização total de corpos 3D aproximadamente esféricos*, Title (english): *Estimation of the total magnetization direction of approximately 3D spherical bodies*, ID: 445752/2014-9, Research grant: MCTI/CNPQ/Universal 14/2014, R$ 20 000.00, Nov/2014 – Nov/2017.

(5) Fundação Carlos Chagas Filho de Amparo à Pesquisa do Estado do Rio de Janeiro (FAPERJ), Title (portuguese): *Infraestrutura computacional para a estimação da magnetização de corpos 3D aproximadamente dipolares*, Title (english): *Computational infrastructure for estimating the magnetization direction of approximately dipolar bodies*, ID: E-26/111.152/2014, Research grant: INST - Auxílio Instalação - 2013/2 , R$ 10 000.00, Jun/2014 – Mar/2016.