

Lineament Analysis of Morphostructures of the Uchur-Maya Basin (Southeastern Siberian Platform) from SRTM Data: Relationship with Metallogeny

PDF (Size: 375KB) PP. 1176-1186 DOI: 10.4236/ijg.2012.326119

Author(s)

Gil' shat Z. Gil' manova, Mikhail V. Goroshko, Oleg V. Rybas, Alexei N. Didenko

ABSTRACT

Based on digital elevation models SRTM03 and SRTM30_Plus (Shuttle Radar Topography Mission Survey) the technique for detecting major structural elements and elucidating details of the geologic structure including discrimination of linear structures and texture features is elaborated. The computation of the modulus of the first derivative by the co- ordinate, *i.e*

KEYWORDS

Space SRTM Survey; Lineaments; The Uchur-Maya Basin; Metallogeny

Cite this paper

G. Gil' manova, M. Goroshko, O. Rybas and A. Didenko, "Lineament Analysis of Morphostructures of the Uchur-Maya Basin (Southeastern Siberian Platform) from SRTM Data: Relationship with Metallogeny," *International Journal of Geosciences*, Vol. 3 No. 6A, 2012, pp. 1176-1186. doi: 10.4236/ijg.2012.326119.

References

- [1] O. V. Rybas and G. Z. Gil' manova, " Application of the Scale-Space Theory for Detection and Analysis of the Topography Structures from SRTM Data," *Investigation of the Earth from Space*, No. 6, 2011, pp. 45-52.
- [2] O. V. Rybas, G. Z. Gil' manova and M. V. Goroshko, " Application of Transformed Small-Scale Digital Elevation Models for Detection of Major Crustal Blocks," *XIII Russian Conference " Distributed Information and Computational Resources" (DICR' 2010)*, Novosibirsk, 30 November-3 December 2010, p. 28. <http://conf.nsc.ru/dicr2010/ru/reportview/31576>
- [3] A. Zlatopolsky, " Description of Texture Orientation in Remote Sensing Data Using Computer Program LESSA," *Computers&Geosciences*, Vol. 23. No. 1, 1997, pp. 45-62. doi:10.1016/S0098-3004(96)00053-2
- [4] M. A. Semikhatov and S. N. Serebryakov, " Siberian Hypostratotype of the Riphean," *Nedra, Moscow*, 1983.
- [5] A. K. Khudoley, R. H. Rainbird, R. A. Stern, A. P. Kropachev, L. M. Heaman, A. M. Zanin, V. N. Podkovyrov, V. N. Belova and V. I. Sukhorukov, " Sedimentary Evolution of the Riphean—Vendian Basin of Southeastern Siberia," *Precambrian Research*, Vol. 111, No. 1-4, 2001, pp. 129-163. doi:10.1016/S0301-9268(01)00159-0
- [6] S. A. Pisarevsky and L. M. Natapov, " Siberia and Rodinia," *Tectonophysics*, Vol. 375, No. 1-4, 2003, pp. 221-245. doi: 10.1016/j.tecto.2003.06.001
- [7] M. V. Goroshko and V. A. Gur' yanov, " Ore Mineralization Related to the Zone of the Pre-Riphean Structural-Stratigraphic Unconformity and Lower Riphean Platform Cover of the Uchur-Maya Depression, the Southeastern Siberian Platform," *Russian Journal of Pacific Geology*, Vol. 1, No. 6, 2007, pp. 586-602. doi: 10.1134/S1819714007060073

- [8] M. V. Goroshko and V. A. Gur' yanov, " Meso-Neoproterozoic Complexes of Southeastern Siberian Platform Cover: Conditions of the Formation and Main Tectonic Features," *Geotectonics*, No. 2, 2008, pp. 147-163. doi: 10.1134/S0016852108020052
- [9] A. N. Didenko and M. V. Goroshko, " Uchur-Maya Sedimentary Basin of Southeastern Siberian Craton: Stratigraphy, Geodynamics and Petroleum Potential," *Proceedings of the Conference, Novosibirsk*, 30 June-2 August 2011, pp. 17-18.
- [10] G. V. Ovchinnikova, M. A. Semikhatov, I. M. Vasil' eva, I. M. Gorokhov, O. K. Kaurova, V. N. Podkovyrov and B. M. Gorokhovskii, " Pb– Pb Age of Limestones of the Middle Riphean Malgina Formation, the Uchur-Maya Region of East Siberia," *Stratigraphy and Geological Correlation*, Vol. 9, No. 6, 2001, pp. 527-540.
- [11] M. A. Semikhatov, " Refinement of the Estimates of the Isotopic Age of the Lower Boundary of the Upper Riphean, Vendian, Upper Vendian and Cambrian," *Additions to the Stratigraphic Code of Russia*, St. Petersburg, 2000.
- [12] R. H. Rainbird, R. A. Stern, A. K. Khudoley, A. P. Kropachev, L. M. Heaman and V. I. Sukhorukov, " U-Pb Geochronology of Riphean Sandstone and Gabbro from Southeast Siberia and Its Bearing on the Laurentia-Siberia Connection," *Earth and Planetary Scientific Letters*, Vol. 164, No. 3, 1998, pp. 409-420. doi: 10.1016/S0012-821X(98)00222-2
- [13] *The State of Precambrian and Phanerozoic Stratigraphic Study in Russia, " Objectives for Further Investigations. Resolutions of the Interdepartmental Stratigraphic Committee and Its Standing Commissions," VSEGEI Publishing House, Saint-Petersburg, 2008, 131 p.*
- [14] V. I. Vinogradov, V. I. Murav' ev, M. I. Bujakaite, D. I. Golovin, V. M. Gorozhanin and A. F. Veis, " Epigenesis of Middle Riphean Rocks in the Bashkir Meganticlinorium, Southern Urals: Timing of Alterations and Geological Implications," *Lithology and Mineral Resources*, Vol. 35, No. 6, 2000, pp. 571-583. doi: 10.1023/A:1026601616053
- [15] V. A. Yan-Zhin-Shin, " Tectonics of the Sette-Daban Horst-Anticlinorium," *Yakutsk Branch of the Siberian Division of the Academy of Sciences of the USSR, Yakutsk*, 1983.
- [16] *Vendian System, " Historical and Geological and Paleontological Study," In: B. S. Sokolov and M. A. Fedonkin, Eds., Stratigraphy and Geological Processes, Nauka, Moscow, 1985, 237 p.*
- [17] M. A. Semikhatov, G. V. Ovchinnikova, I. M. Gorokhov, A. B. Kuznetsov, O. K. Kaurova and P. Yu. Petrov, " Pb-Pb– Isochronic Age and Sr-Isotopic Characteristic of the Upper Yudoma Carbonate Deposits (Vendian of the Udoma-Maya Trough, Eastern Siberia)," *Doklady Akademii Nauk*, Vol. 393, No. 1, 2003, pp. 83-87.
- [18] A. N. Didenko, V. Yu. Vodovozov, I. K. Kozakov and E. V. Bibikova, " Paleomagnetic and Geochronological Study of Post-Collisional Early Proterozoic Granitoids in the Southern Siberian Platform: Methodological and Geodynamic Aspects," *Izvestiya. Physics of the Solid Earth*, Vol. 41, No. 2, 2005, pp. 156-172.
- [19] K. C. Condie, " Breakup of a Paleoproterozoic Super continent," *Gondwana Research*, Vol. 5, No. 1, 2002, pp. 41-43. doi: 10.1016/S1342-937X(05)70886-8
- [20] A. P. Witkin, " Scale-Space Filtering," *Proceedings 8th International Joint Conference on Artificial Intelligence, Karlsruhe*, 1983, pp. 1019-1022.
- [21] J. J. Koenderink, " The Structure of Images," *Biological Cybernetics*, Vol. 50, No. 5, 1984, pp. 363-370. doi: 10.1007/BF00336961
- [22] J. J. Koenderink and A. J. van Doorn, " Representation of Local Geometry in the Visual System," *Biological Cybernetics*, Vol. 55, No. 6, 1987, pp. 367-375. doi: 10.1007/BF00318371
- [23] Yu. F. Malyshev and M. V. Goroshko, " Regional Potassic Metasomatism and Metallogeny of Precambrian Structural-Stratigraphic Unconformity Zones (Southeastern Siberian Platform)," *Doklady Rossiyskoy Akademii Nauk*, Vol. 423, No. 5, 2008, pp. 663-666.
- [24] M. V. Goroshko and V. A. Guroyanov, " Conditions of Location of Complex Uranium-Rare Metal Mineralization in the Massifs of Ultrabasic Alkali Rocks, South-Eastern Part of the Siberian Platform," *Russian Journal of Pacific Geology*, Vol. 23, No. 2, 2004, pp. 76-91.
- [25] L. M. Parfenov and M. I. Kuz' min, " Tectonics, Geodynamics and Metallogeny of the Sakha Republic (Yakutia)," *Nauka/Interperiodika, Moscow*, 2001.
- [26] L. J. Pesonen, S. A. Elming, S. Mertanen, S. Pisarevsky, M. S. D' Agrella, J. G. Meert, P. W. Schmidt, N. Abrahamsen and G. Bylund, " Palaeomagnetic Configuration of Continents during the Proterozoic," *Tectonophysics*, Vol. 375, No. 1-4, 2003, pp. 289-324. doi: 10.1016/S0040-1951(03)00343-3

- [27] Z. X. Li, S. V. Bogdanova, A. S. Collins, A. Davidson, B. De Waele, R. E. Ernst, I. C. W. Fitzsimons, R. A. Fuck, D. P. Gladkochub, J. Jacobs, K. E. Karlstrom, S. Lu, L. M. Natapov, V. Pease, S. A. Pisarevsky, K. Thrane and V. Vernikovsky, " *Assembly, Configuration, and Break-Up History of Rodinia: A Synthesis,*" *Precambrian Research*, Vol. 160, No. 1-2, 2008, pp. 179-210. doi: 10.1016/j.precamres.2007.04.021
- [28] R. E. Ernst, K. L. Buchan, M. A. Hamilton, A. V. Okrugin and M. D. Tomshin, " *Integrated Paleomagnetism and U-Pb Geochronology of Mafic Dikes of the Eastern Anabar Shield Region, Siberia: Implications for Mesoproterozoic Paleolatitude of Siberia and Comparison with Laurentia,*" *The Journal of Geology*, Vol. 108, No. 3, 2000, pp. 383-401.
- [29] T. N. Kheraskova, V. A. Bush, A. N. Didenko and S. G. Samygin, " *Breakup of Rodinia and Early Stages of Evolution of the Paleoasian Ocean,*" *Geotectonics*, Vol. 44, No. 1, 2010, pp. 1-24.

• [Open Special Issues](#)

• [Published Special Issues](#)

• [Special Issues Guideline](#)

[IJG Subscription](#)

[Most popular papers in IJG](#)

[About IJG News](#)

[Frequently Asked Questions](#)

[Contact Us](#)