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Tectonophysical digital database of Sakhalin Island

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Abstract. The paper summarizes the results of field tectonophysical studies of Sakhalin Island conducted by different researchers at different times. Information about the main characteristics of the stress-strained state of the upper part of the Earth's crust (principal stress axes, stress state type, Lode–Nadai coefficient, bedding planes) was obtained as a result of computations using methods of cataclastic analysis of discontinuous displacements, structural-paragenetic, kinematic, conjugate pairs of faults. The input data for the calculations were the materials of field measurements of fracturing, slickensides and structural patterns. The results obtained in the present and previous works on Sakhalin field tectonophysical research are represented in summary tables that include data on local stress states for 264 observation points. The results are incorporated to GIS, the Isoline GIS software is used for the database management system.

Keywords:
fracturing, slickensides, stress-strained state of the Earth's crust, principal stress axes, Lode–Nadai coefficient

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References

1. *Russian tectonophysics: In M.V. Gzovsky's 100th Anniversary commemoration*: Collectted works. **2019.** Apatity: FITS KNTS RAN, 359 p. (In Russ).
2. Shpetalenko L.P., Chmikhalova T.P., Chaynikova M.V. **1976.** [*Atlas of tectonic structures of Sakhalin coal deposits*]. Yuzhno-Sakhalinsk: Far East Publ. Hous, 93 p. (In Russ.).
3. Kamenev P.A., Marinin A.V. **2023.** Reconstruction of paleostresses in the West of Sakhalin from tectonophysical research findings. *Journal of Mining Science*, 59(6): 919–929. https://doi.org/10.1134/S1062739123060054
4. Sim L.A., Bogomolov L.M., Bryantseva G.V., Savvichev P.A. **2017.** Neotectonics and tectonic stresses of the Sakhalin Island. *Geodynamics & Tectonophysics*, 8(1): 181–202. (In Russ.). https://doi.org/10.5800/GT-2017-8-1-0237
5. Rebetskiy Yu.L. **2007.** [*Tectonic stresses and strength of natural massifs*]. Moscow: Akademkniga, 406 p. (In Russ.).
6. Tataurova A.A. **2015.** Stress and strain fields based on data on crustal earthquake mechanisms in Sakhalin Island. *Vestnik KRAUNTs. Nauki o Zemle = Bull. of KRAESC. Earth Sciences*, 3(27): 93–101. (In Russ.).
7. Sim L.A., Bogomolov L.M., Kuchai O.A., Tataurova A.A. **2017.** Neotectonic and modern stresses of South Sakhalin. *Russian Journal of Pacific Geology*, 11(3): 223–235. https://doi.org/10.1134/s1819714017030058
8. Sim L.A., Kamenev P.A., Bogomolov L.M. **2020.** New data on the latest stress state of the earth's crust on Sakhalin Island (based on structural and geomorphological indicators of tectonic stress). *Geosistemy perehodnykh zon = Geosystems of Transition Zones*, 4(4): 372–383. (In Russ.). https://doi.org/10.30730/gtrz.2020.4.4.372-383
9. Marinin A.V., Rebetsky Yu.L, Sim L.A., Kamenev P.A., Kostrov Yu.V., Bondar I.V., Gordeev N.A., Degtyarev V.A. **2021.** Reconstruction of tectonic stresses on the Schmidt Peninsula, Sakhalin. *Vestnik KRAUNTs. Nauki o Zemle = Bull. of KRAESC. Earth Sciences*, 4(52): 73–88. (In Russ.). https://doi.org/10.31431/1816-5524-2021-4-52-73-88
10. Kamenev P.A., Marinin A.V., Degtyarev V.A., Lukmanov A.R. Reconstruction of tectonic stresses of the Central Sakhalin. **2023.** *Vestnik KRAUNTs. Nauki o Zemle = Bull. of KRAESC. Earth Sciences*, 57(1): 89–103. (In Russ.).

https://doi.org/10.1134/s1819714023080079

11. Kamenev P.A., Marinin A.V. **2024.** *Sakhalin Island tectonophysical database*: certificate of registration of the database: RU 2024623290, No. 2024623016 of 12.07.2024; publ. 24.07.2024, Bull. № 8.
12. Sharueva L.I., Lopatin B.G., Roganov G.V. et al. (comp.) **2016.** [*State Geological map of Russian Federation on a scale of 1:1 000 000. Third generation. Far East series. Sheet N-54 (Nikolaevsk-na-Amure)*]: [Explanatory note]. Saint Petersburg: Kartograf. fabrika VSEGEI, 477 p. (In Russ.). URL: https://www.vsegei.ru/ru/info/pub_ggk1000-3/Dalnevostochnaya/n-54.php
13. Alenicheva A.A., Lizganov A.V., Ivanova V.V. et al. (comp.) **2019.** [*State Geological map of Russian Federation on a scale of 1:1 000 000. Third generation. Far East series. Sheet L-(53), 54 (Yuzhno-Sakhalinsk)*]: [Explanatory note]. St. Petersburg: Kartograf. fabrika VSEGEI, 536 p. (In Russ.). URL: https:// www.vsegei.ru/ru/info/pub_ggk1000-3/Dalnevostochnaya/l-53-54.php
14. Richter A.V. **1986.** *The structure and tectonic development of Sakhalin in the Mesozoic*. Moscow: Nauka, 93 p. (Proceedings of the GIN RAS; Iss. 411). (In Russ.).
15. Rastsvetaev L.M. **1987.** Paragenetic method of structural analysis of disjunctive tectonic faults. In: *Problems of structural geology and physics of tectonic processes*. Moscow: GIN AN SSSR, pt. 2: 173–235. (In Russ.).
16. Gushchenko O.I. **1975.** The kinematic principle of reconstruction of the directions of the main stresses (according to geological and seismological data). *Doklady AN SSSR = Proceedings of the USSR Academy of Sciences*, 225(3): 557–560. (In Russ.).
17. Gzovsky M.V. **1975.** *Fundamentals of tectonophysics*. Moscow: Nauka, 535 p. (In Russ.).
18. Sim L.A. **1982**. [Determination of the regional field from the data on local stresses on separate sites]. *Izvestia vuzov. Geologiya i razvedka = Geology and Exploration*, 4: 35–40. (In Russ.).
19. Rebetskiy Yu.L., Sim L.A., Marinin A.V. **2017.** [*From slickensides to tectonic stresses. Methods and algorithms*]. Moscow: GEOS, 234 p. (In Russ.).
20. Rebetsky Yu.L., Sycheva N.A. **2024.** The stressed state of the Earth's crust in the Altai-Sayan mountain region: reconstruction based on the modified algorithms of the cataclastic method. *Geosistemy perehodnykh zon = Geosystems of Transition Zones*, 8(4): 261–276. (In Russ., abstr. in Engl.). https://doi.org/10.30730/gtrz.2024.8.4.261-276
21. Kamenev P.A., Degtyarev V.A., Zherdeva O.A., Kostrov Yu.V. **2024.** The fault kinematics of the Sakhalin Island based on geological and seismological methods. *Geosistemy perehodnykh zon = Geosystems of Transition Zones*, 8(1): 37–46. https://doi.org/10.30730/gtrz.2024.8.1.037-046; URL: http://journal.imgg.ru/web/full/f-e2024-1-3.pdf
22. Anisimov G.A., Valeeva S.E., Valeeva I.F., Anisimova L.Z. **2016.** About the current situation on the use of software systems in the mineral wealth use. *Exposition Oil & Gas*, 6(52): 13–15. (In Russ.).