GESER DUGAROV, Ph.D.

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languages: English (advanced), Russian (native)
age: 33
location: Novosibirsk, Russia

SUMMARY

Specialist in the field of multiwave seismic survey, engaged in research of seismic wave propagation theory. Holds a degree of a Doctor of Philosophy (Ph.D.) in Geophysics. Experienced in project management and science advising. Areas of expertise include seismic anisotropy of rocks, wave attenuation, and physical properties of hydrate-bearing media. Currently exploring Data Science area.

TECHNICAL SKILLS

Python, Matlab, Wolfram Mathematica (symbolic computation), Git.

EDUCATION

PhD, Geophysics,
Trofimuk Institute of Petroleum Geology and Geophysics SB RAS,
Novosibirsk, Russia
X/2009 – XII/2013
(4 years)

Thesis: Estimation of fractured medium effective parameters from seismic wave velocity and attenuation anisotropy data using the linear slip model.

MSc, Computational and Applied Mathematics,
Novosibirsk State University, Novosibirsk, Russia
IX/2004 – VI/2009
(5 years)

Thesis: Parallel algorithms for solving the traveling salesman problem.

WORK EXPERIENCE

Senior Researcher,
Trofimuk Institute of Petroleum Geology and Geophysics SB RAS,
Novosibirsk, Russia
X/2009 – current
(11 years)

Senior Researcher (IV/2019 – current)

Tasks. Research planning and management on the following topics. Estimation of target object parameters from reflected seismic wave data (AVOAz inversion); physical properties of hydrate-bearing rocks (acoustic measurements, X-ray tomography); 3D printing technology for fractured rock modelling. Supervising research at undergraduate and postgraduate levels.

Achievements. Currently ongoing projects. Graduate students: 1 MSc (2020), 1 BSc (2020).

Python, *Matlab*, *Git*, *Wolfram Mathematica* (symbolic computation)*, OriginLab* (visualization).

Research Associate (II/2014 – IV/2019)

Tasks. Obtaining experimental measures of acoustic properties of hydrate-bearing samples. Data processing and analysis. Studying attenuation estimation from seismic data (namely from vertical seismic profiling, VSP). Managing of small research projects. Writing project reports and scientific papers.

Achievements. Collected data on acoustic properties of hydrate-bearing samples depending on various factors including rock-matrix material, amount and morphology of hydrate content in pores. Developed module for Q factor estimation from VSP data based on modified spectral ratio method.

Research Assistant (X/2009 – II/2014)

Tasks. Working on the PhD thesis. Studying velocity and attenuation anisotropy of compressional and shear waves, the relationships between anisotropic parameters and physical properties of fractured rocks.

Achievements. PhD degree in Geophysics. Developed algorithm for estimation of effective parameters in the linear slip model of fractured media from velocity and attenuation anisotropy data.

Engineer,
Nuclear Safety Institute RAS, Novosibirsk Branch,
Novosibirsk, Russia
IX/2013 – V/2017
(3 years)

Tasks. Development of software (HYDRA-IBRAE/LM/V1) for numerical modelling of flow and heat-exchange of sodium coolant in fast-neutron reactors (including coolant boiling). Development of automation testing.

Achievements. Updated closure relationships for two-phase coolant flow. Developed automation testing system with modelling results visualization.

C++, *Python*, *SVN*, *OriginLab* (visualization).

QA engineer,
ATAPY Software, Novosibirsk, Russia
X/2008 – VIII/2009
(1 year)

Tasks. Testing and identifying deficiencies in document imaging, data capture and document processing solutions.

Jira (issue tracking), *StarTeam* (revision control), *VirtualBox* (virtualization).

PROJECTS

Modelling of fractured media using synthetic samples printed on a 3D printer
II/2019 – XII/2021
(3 years)

Supported by the Russian Foundation for Basic Research, grant No. 19-05-00730.
Role: **head of the project**.
Team size: 4.

The project is aimed to develop a methodology of fractured media modelling through 3D printing due to the possibility of controlled parameters variations. The project is in progress.

AVAZ inversion development for estimation of target object anisotropy parameters from 3D seismic data **XII/2019 – VI/2021 (1.5 years)**

Customer: NTC NIS-Naftagas, Serbia
Role: **team leader**.
Team size: 7.

The project is aimed to development of technology and software for AVAZ inversion of target object anisotropy parameters from 3D seismic data. The project is in progress.

Studying of the acoustic properties and internal structure of methane-hydrate-bearing coal samples **VII/2019 – VI/2021 (2 years)**

Supported by the Russian Science Foundation**,** grant No. 19-77-00068.
Role: **head of the project**.
Team size: 5.

We study acoustic properties of coal samples with different methane hydrate saturation. In-situ 3D X-ray tomography during hydrate formation was used for hydrate microstructure analysis. The results show a more complicated behavior that differs from similar experiments with sand samples. A competitive sorption of methane and water in the coal pore space was revealed, which leads to a stronger change of acoustic properties during gas-hydrate formation than during freezing.

Laboratory experiments on the formation of gas hydrates in coal samples **II/2017 – XI/2018 (2 years)**

Supported by the Russian Foundation for Basic Research, grant No. 17-35-80023.
Role: **head of the project**.
Team size: 4.

We did a series of experiments on formation of methane hydrate in crashed bituminous coal samples. As a result, the methodology of gas hydrate formation from different types of water in coal samples was developed. Also, a dependence of acoustic properties from temperature and stress was revealed.

HONORS AND AWARDS

- "The best young researcher in Earth science organizations" from the Government of Novosibirsk (2019).
- Winner of the contest among young researchers with PhD degree in Earth sciences from the Council for grants of the president of the Russian Federation (2019).

PUBLICATIONS

Author and coauthor of more than 50 scientific publications. A publication track record in databases: WoS (D-4183-2014), Scopus (56910226400). Main publications are the following.

- Dugarov G.A., Duchkov A.A., and Manakov A.Yu. (2021) Acoustic properties of hydrate-bearing coal samples depending on temperature and water saturation type. *Geophysics*, 86(3), U31-U37, doi: 10.1190/geo2020-0117.1

- Nikitin V.V., Dugarov G.A., Duchkov A.A., Fokin M.I., Drobchik A.N., Shevchenko P.D., de Carlo F., and Mokso R. (2020) Dynamic in-situ imaging of methane hydrate formation and self-preservation. *Marine and Petroleum Geology*, 115, 104234, doi: 10.1016/j.marpetgeo.2020.104234
- Dugarov G.A., Duchkov A.A., Duchkov A.D., and Drobchik A.N. (2019) Laboratory validation of effective acoustic velocity models for samples bearing hydrates of different type. *Journal of Natural Gas Science and Engineering*, 63, 38-46, doi: 10.1016/j.jngse.2019.01.007
- Usov E.V., Butov A.A., Dugarov G.A., Kudasov I.G., Lezhnin S.I., Mosunova N.A., and Pribaturin N.A. (2017) System of closing relations of a two-fluid model for the HYDRA-IBRAE/LM/V1 code for calculation of sodium boiling in channels of power equipment. *Thermal Engineering*, 64(7), 504-510, doi: 10.1134/S0040601517070102
- Usov E.V., Pribaturin N.A., Kudashov I.G., Butov A.A., Dugarov G.A., Mosunova N.A., Strizhov V.F., and Ivanov E.N. (2015) A step in the verification of the HYDRA-IBRAE/LM/V1 thermohydraulic code for calculating sodium coolant flow in fuel-rod assemblies. Atomic Energy, 118(6), 382-388, doi: 10.1007/s10512-015-0012-8
- Chichinina T., Dugarov G., and Obolentseva I. (2013) Fracture–induced Q–anisotropy: Inversion for fracture parameters. *SEG Technical Program Expanded Abstracts*, 32, 335–340, doi: 10.1190/segam2013-0590.1
- Obolentseva I., Dugarov G., and Chichinina T. (2011) Estimation of complex–valued weaknesses from velocity–attenuation anisotropy data in linear–slip TI model of fractured media. *SEG Technical Program Expanded Abstracts*, 30, 4393–4398, doi: 10.1190/1.3658767
- Tarkov M.S., Dugarov G.A. (2010) A parallel algorithm for solving the traveling salesman problem by a recurrent neural network. *Bulletin of the Novosibirsk Computing Center. Series: Computer Science*, 30, 89-94.

ADDITIONAL INFORMATION

- Field practice in near-surface vertical seismic profiling (Novosibirsk Region, Russia, VI/2015, VI/2014) and near-surface seismic and electromagnetic surveys (Novosibirsk Region, Russia, VI/2011)

Last update: 15.06.2021

The latest version of CV could be found on https://geserdugarov.github.io