

GESER DUGAROV, Ph.D.

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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. Research interests include seismic anisotropy of rocks, effective acoustic models of fractured media, seismic wave attenuation, and physical properties of hydrate-bearing rocks. Current main tasks are ongoing projects' management (as a head of the project or a team leader), research planning and science advising.

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. Planning research and managing of projects on the following topics. Algorithms for estimation of target object parameters from reflected seismic wave data (AVOAz inversion); physical properties of hydrate-bearing rocks (acoustic measurements, X-ray tomography, effective models of hydrate-bearing media); 3D printing technology for modelling of fractured rock. Supervising research at undergraduate and postgraduate levels.

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

Python, Matlab, Wolfram Mathematica.

Research Associate (II/2014 – IV/2019)

Tasks. Performing experimental acoustic measurements on hydrate-bearing samples with subsequent data processing and analysis. Studying attenuation estimation from seismic data, namely from vertical seismic profiling (VSP) data. 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. Successfully completed first own project supported by Russian Foundation for Basic Research (grant No. 17-35-80023).

Research Assistant (X/2009 – II/2014)

Tasks. Working on the PhD thesis. Studying effective models (homogeneous approximation) of fractured media, velocity and attenuation anisotropy of compressional and shear waves, the relationship between the anisotropic parameters that control seismic signatures and the physical properties of the 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 of compressional and shear waves.

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 test automation system.

Achievements. Two certificates of software state registration. Developed automated testing system with automated plotting of numerical modelling results (using *LabTalk*, the scripting language in OriginLab software for interactive scientific graphing and data analysis).

C++, python, SVN (revision control), *OriginLab* (visualization).

QA engineer,

ATAPY Software, Novosibirsk, Russia

**X/2008 – VIII/2009
(1 year)**

Tasks. Testing and identifying deficiencies in document imaging and data capture solutions with subsequent document processing workflow. Collaborating with the Product Development team. Preparing and presenting reports.

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

PROJECTS

Team leader,

customer: **NTC NIS-Naftagas, Serbia**

**XII/2019 – VI/2021
(1.5 years)**

Title: AVAZ inversion technology and software development for estimation of target object anisotropy parameters from 3D seismic data.

Team size: 7.

Head of the project,grant No. [19-77-00068](#),**Russian Science Foundation****VII/2019 – VI/2021****(2 years)**

Title: Investigation of the acoustic properties of methane-hydrate-bearing coal samples for the development of a seismic monitoring system of coal mining in order to predict gas-dynamic phenomena.

Team size: 2.

Head of the project,

grant No. 19-05-00730,

Russian Foundation for Basic Research**II/2019 – XII/2021****(3 years)**

Title: Calibration and correction of effective models of fractured media using acoustic measurements on synthetic samples printed on a 3D printer.

Team size: 4.

Head of the project,

grant No. 17-35-80023,

Russian Foundation for Basic Research**II/2017 – XI/2018****(2 years)**

Title: Laboratory experiments on the formation of gas hydrates in coal samples and measurement of their acoustic properties for the development of geophysical methods for monitoring and forecasting gas-dynamic phenomena in the development of coal deposits.

Team size: 4.

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*, 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
- Duchkov A.D., Duchkov A.A., [Dugarov G.A.](#), and Drobchik A.N. (2018) Velocities of ultrasonic waves in sand samples containing water, ice, or methane and tetrahydrofuran hydrates

(laboratory measurements). *Doklady Earth Sciences*, 478(1), 74-78, doi: 10.1134/S1028334X18010014

- 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

- *Python* and *C++* programming skills.
- *Matlab* and *Wolfram Mathematica* programming skills.
- Field practice in near-surface vertical seismic profiling, Novosibirsk Region, Russia, VI/2014, VI/2015.
- Field practice in near-surface seismic and electromagnetic surveys, Novosibirsk Region, Russia, VI/2011.

Last update: 12.03.2021