

## ANATOLIY KHAIT

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 Google scholar: <https://scholar.google.com/citations?user=rb43D9MAAAAJ>

### Education

- |                |                                   |  |
|----------------|-----------------------------------|--|
| 2009 - 2013    | Ph.D.                             | Ural Federal University, Ekaterinburg, Russia<br>Institute of Civil Engineering<br><i>Supervisor:</i> Prof. A.S. Noskov<br><i>Field:</i> Hydraulic machines and hydro-pneumatic units<br><i>Thesis:</i> Numerical and experimental study of the energy separation effect aimed at improvement of the vortex tube characteristics (in Russian)  |
| Aug.-Nov. 2013 |                                   | Intensive Course, University of Genoa, Italy<br>Division of Thermal Energy and Environmental Conditioning<br>EU Tempus Project n. 530620-TEMPUS-2012-1-IT-JPCR<br><i>Supervisors:</i> Prof. V. Bianco and Prof. A.S. Noskov<br><i>Field:</i> Energy Saving and Environmental Protection and Control<br><i>Final project:</i> Investigation of energy efficiency of climatic system based on a double-circuit vortex tube |
| 2004 - 2009    | B.Sc. and M.Sc.<br>(direct track) | ( <i>Cum Laude</i> ) Ural State Technical University (UPI),<br>Ekaterinburg, Russia<br><i>Supervisor:</i> Prof. A.S. Noskov<br><i>Field:</i> Hydraulic machines, hydraulic drive, hydraulic and pneumatic automatics<br><i>Thesis:</i> Numerical modeling of drilling fluid cooling process (in Russian)   |
| 2006 - 2009    | B.Sc.<br>(dual degree)            | Ural State Technical University (UPI),<br>Ekaterinburg, Russia<br><i>Supervisors:</i> Prof. V.A. Tyutin and Prof. A.S. Noskov<br><i>Field:</i> Economics and business management<br><i>Thesis:</i> Economic justification of the design of the drilling fluid cooling system (in Russian)  |

### Engineering Employment

- 2008 - 2016 *Mechanical Engineer* at Design Bureau Chkz-Yugson, Ekaterinburg, Russia
- Engineering developments of mechanical and hydraulic parts
  - Engineering computations related to deformable solids, hydraulic drive systems, heat exchangers, heat transfer and thermodynamic processes: HyDrawSim (self-made in-house code), MATLAB Simulink, COSMOSWorks, ANSYS, LIRA
  - Solid modeling and drafting in ASCON KOMPAS, SolidWorks, AutoCAD
  - Programming for industrial controllers FASTWEL

## Academic Employment

- Oct.2021 - present      *Lecturer* (tenure track)  
Department of Mechanical Engineering & Mechatronics,  
Faculty of Engineering, Ariel University
- May.2019 - July.2021    *Post-Doctoral Research Associate (PDRA) with Dr. Zhihua Ma*  
([Link to the University Web Page](#)),  
Centre for Mathematical Modelling and Flow Analysis,  
Department of Computing and Mathematics,  
Manchester Metropolitan University, UK
- Dec.2016 - Apr.2019    *Post-Doctoral Fellow with Prof. Lev Shemer* ([www.eng.tau.ac.il/shemer](http://www.eng.tau.ac.il/shemer))  
Water Waves Research Laboratory,  
School of Mechanical Engineering,  
Tel Aviv University, Israel
- 2015 - 2016              *Senior Lecturer*  
Institute of Civil Engineering, Ural Federal University, Russia  
(non-tenured position)
- 2014 - 2015              *Lecturer*  
Institute of Civil Engineering, Ural Federal University, Russia  
(non-tenured position)
- 2011 - 2014              *Teaching assistant*  
Institute of Civil Engineering, Ural Federal University, Russia

## Research Experience

### High Performance Computing:

- Parallel computing: C/C++, Fortran, OpenMP, MPI, CUDA
- Finite Volume Method, Boundary Element Method, etc.
- Other software: Python, Matlab, Wolfram Mathematica, etc.

### Nonlinear dynamics of deterministic water waves:

- Wave flume experiments including video-imaging and subsequent image processing
- Programming for LabView
- Numerical models for fully-nonlinear potential problems: Boundary Element Method, High Order Spectral Method, Conformal Mapping
- Theoretical models based on Zakharov, Nonlinear Schrödinger, Dysthe equation, etc.
- Analytical solutions for weakly-nonlinear water waves problems

### Computational Fluid Dynamics (CFD):

- Turbulence modeling
- Thermodynamic analysis including Entropy Generation Minimization method
- Heat and mass transfer problems
- OpenFOAM, SU2, ANSYS CFX, ANSYS Fluent, etc.
- In-house compressible and incompressible solvers

Hydraulic drive dynamics:

- Automatic composition and numerical solution of nonlinear equation systems describing hydraulic circuit dynamics
- Graphical user interface for definition of hydraulic circuit

## Courses Taught

Ariel University (2021-present):

- Heat transfer 1 undergraduate

Ural Federal University (2011-2016):

- Fluid mechanics and hydraulics undergraduate
- Aerodynamics of ventilation undergraduate
- Hydraulic and pneumatic systems undergraduate
- Fundamentals of engineering and scientific experiment undergraduate
- Discrete mathematics for civil engineers undergraduate

## Research Students

- 2015-2017* I. Shikhovtsova, M.Sc.  
Thesis: Low-Reynolds turbulence models for modelling of airflow in the rotating radial-axial channel (In Russian)  
Co-advisor, Ural Federal University
- 2015* R. Ivanov, B.Sc.  
Thesis: Technical and economic feasibility of the cooling and heating systems based on vortex tubes in civil engineering (In Russian)  
Co-advisor, Ural Federal University
- 2015* M. Popova, B.Sc.  
Thesis: A dynamic model of thermal protection for the building envelope (In Russian)  
Co-advisor, Ural Federal University
- 2014-2016* A. Tokarev, M.Sc.  
Thesis: Modification of OpenFOAM solver for numerical modeling of airflow in the rotating radial-axial channel (In Russian)  
Co-advisor, Ural Federal University
- 2014-2016* I. Medyantseva, M.Sc.  
Thesis: Numerical study of airflow in the rotating radial-axial channel employing ANSYS CFX and Fluent solvers (In Russian)  
Co-advisor, Ural Federal University
- 2014* D. Litvinov, B.Sc.  
Thesis: Energetic characteristics of the air conditioning system based on a double-circuit vortex tube (In Russian)  
Co-advisor, Ural Federal University

- 2014 E. Kostareva and V. Gasan, B.Sc.  
Thesis: Numerical study of the double-circuit vortex tube characteristics (In Russian)  
Co-advisor, Ural Federal University
- 2013 A. Postnikova, B.Sc.  
Thesis: Numerical study of the vortex tube deceleration unit (In Russian)  
Co-advisor, Ural Federal University

## Grants, Fellowships, and Awards

- 2015-2016 Finalist on the main list in the Russian Fulbright Visiting Scholar Program
- 2013-2015 Grant number D-23/13 from Russian Academy of Architecture and Construction Sciences. Under the supervision of Profs. V. Alekhin and A. Noskov
- 2013 Participation in EU Tempus Project n. 530620-TEMPUS-2012-1-IT-JPCR Intensive Retraining Course, University of Genoa
- 2011 Grant for the beginner scientists, Ural Federal University
- 2010 Grant for the beginner scientists, Ural Federal University
- 2009 The best graduate of the Ural State Technical University

## Professional Society Activities

Member of A Collaborative Computational Project in Wave Structure Interaction  
<http://ccp-wsi.ac.uk>

Co-Guest Editor for a Special Issue "Entropy Production in Turbulent Flow"  
[http://www.mdpi.com/journal/entropy/special\\_issues/Entropy\\_Production](http://www.mdpi.com/journal/entropy/special_issues/Entropy_Production)

## Reviewer to

Journal of Fluid Mechanics; Physics of Fluids; International Journal of Thermal Sciences; International Journal of Heat and Mass Transfer; Applied Thermal Engineering; International Journal of Refrigeration; Journal of Turbulence; Chemical Engineering Communications; Special Topics and Reviews in Porous Media; Journal of Fluids Engineering; CEAS Aeronautical Journal; Ocean Engineering; Ships and Offshore Structures; Journal of Marine Science and Engineering; International Journal of Offshore and Polar Engineering

## Languages

Russian - Native; English - Good proficiency (reading and writing);  
Hebrew - Intermediate (in progress)

## Journal Articles with Peer Review

19. **A. Khait**, Z. Ma, On an eddy viscosity model for energetic deep-water surface gravity wave breaking. *Journal of Fluid Mechanics* (IF 3.333), 929 (2021), A29.  
<https://doi.org/10.1017/jfm.2021.863>
18. **A. Khait**, V. Bianco, A. Lovtsov, A. Noskov, V. Alekhin, Novel Transonic Nozzle for Ranque-Hilsch Vortex Tube. *International Journal of Heat and Mass Transfer* (IF 5.584), 180 (2021), 121801. <https://doi.org/10.1016/j.ijheatmasstransfer.2021.121801>
17. **A. Khait**, Z. Ma, L. Qian, W. Bai, Z. Lin, Energy Dissipation and Non-Potential Effects in Wave Breaking. *Journal of Offshore and Polar Engineering* (IF 0.604). *In press*.
16. S. De. Chowdhury, J. G. Zhou, **A. Khait**, D. Causon, L. Qian, C. Mingham, T. Pullen, Local overshoot and wind effects on wave overtopping at vertical coastal structures. *Proceedings of the Institution of Civil Engineers - Maritime Engineering* (IF 1.739), 2021.  
<https://doi.org/10.1680/jmaen.2020.33>
15. **A. Khait**, Third-Order Generation of Narrow-Banded Wave Trains by a Wavemaker. *Ocean Engineering* (IF 3.068), 218 (2020), 108200  
<https://doi.org/10.1016/j.oceaneng.2020.108200>
14. S. K. Singh, **A. Khait**, P. K. Raushan, K. Debnath, Localized and Distributed Energy in Wave–Current Flow. *ASME J. Offshore Mech. Arct. Eng.* (IF 1.186), 143(1), 011202 (2020) <https://doi.org/10.1115/1.4047521>
13. **A. Khait**, L. Shemer, Nonlinear wave generation by a wavemaker in deep to intermediate water depth. *Ocean Engineering* (IF 3.068), 182 (2019), 222–234  
<https://doi.org/10.1016/j.oceaneng.2019.04.065>
12. **A. Khait**, L. Shemer, Application of Boundary Element Method for determination of the wavemaker driving signal. *J. Offshore Mech. Arct. Eng.* (IF 1.186), 141, 061102 (2019)  
<https://doi.org/10.1115/1.4042942>
11. **A. Khait**, L. Shemer, On the kinematic criterion for the inception of breaking in surface gravity waves: Fully-nonlinear numerical simulations and experimental verification. *Physics of Fluids* (IF 3.514), 30, 057103 (2018) *Editor's pick*.  
<https://doi.org/10.1063/1.5026394>
10. **A. Khait**, A. Noskov, V. Alekhin, V. Bianco, Analysis of the local entropy generation in a double-circuit vortex tube, *Applied Thermal Engineering* (IF 4.725), 130 (2018), 1391–1403. <https://doi.org/10.1016/j.applthermaleng.2017.11.136>
9. V.E. Shcherba, V.V. Shalai, V.N. Kostyukov, A.P. Naumenko, A.S. Noskov, A.Yu. Kondyurin, **A.V. Khait**, A mathematical model of the working processes of a hybrid power displacement piston machine with profiled groove seal, *Chemical and Petroleum Engineering* (IF 0.562), 54(5–6), 2018, 335–344. <https://doi.org/10.1007/s10556-018-0484-1>
8. V. Bianco, **A. Khait**, A. Noskov, V. Alekhin, A comparison of the application of RSM and LES turbulence models in the numerical simulation of thermal and flow patterns in a double-circuit Ranque-Hilsch vortex tube, *Applied Thermal Engineering* (IF 4.725), 106 (2016), 1244–1256. <https://doi.org/10.1016/j.applthermaleng.2016.06.095>

7. A.Yu. Kondyurin, V.E. Shcherba, V.V. Shalai, A.S. Noskov, **A.V. Khait**, Calculation of liquid flow through pump-compressor slot seal made in the form of hydrodiode, Chemical and Petroleum Engineering (IF 0.562), 52(3–4), 2016, 267–273.  
<https://doi.org/10.1007/s10556-016-0185-6>
6. A.Yu. Kondyurin, V.E. Shcherba, V.V. Shalai, A.S. Noskov, **A.V. Khait**, Analysis and optimization of basic geometric parameters of annular slot seal made in the form of hydrodiode, Chemical and Petroleum Engineering (IF 0.562), 52(3–4), 2016, 280–289.  
<https://doi.org/10.1007/s10556-016-0187-4>
5. R.E. Perminov, V. Bianco, V.N. Alekhin, A.S. Noskov, **A.V. Khait**, M.N. Popova, Numerical model of thermal protection of building envelope, Akademicheskij vestnik Ural-NIIproekt RAASN, 1(28), 2016, 30–34. <http://uniip.ru/jurnal/eng/archive>
4. A.S. Noskov, V.N. Alekhin, **A.V. Khait**, N.M. Anoshin, Visualization of air flow in vortex tube using different turbulence models, Russian Journal of Construction Science and Technology, 1, 2015, 43–48. <https://journals.urfu.ru/index.php/RJCST/issue/archive>
3. V. Alekhin, V. Bianco, **A. Khait**, A. Noskov, Numerical investigation of a double circuit Ranque-Hilsch vortex tube, International Journal of Thermal Sciences (IF 3.476), 89, 2015, 272–282. <https://doi.org/10.1016/j.ijthermalsci.2014.11.012>
2. **A.V. Khait**, A.S. Noskov, A.V. Lovtsov, V.N. Alekhin, Semi-empirical turbulence model for numerical simulation of swirled compressible flows observed in Ranque-Hilsch vortex tube, International Journal of Refrigeration (IF 3.461), 48, 2014, 132–141.  
<https://doi.org/10.1016/j.ijrefrig.2014.09.006>
1. A.S. Noskov, V.N. Alekhin, **A.V. Khait**, Numerical investigation of Ranque-Hilsch energy separation effect, Applied Mechanics and Materials, 281, 2013, 355–358.  
<https://doi.org/10.4028/www.scientific.net/AMM.281.355>

### Journal Articles with Peer Review (*in Russian*)

7. S.Yu. Pleshkov, **A.V. Khait**, Use of the bearing heat-insulating element in Russian climatic conditions, VSGUTU Bulletin, 6(63), 2016, 67–73 (In Russian).
6. V.N. Alekhin, A.S. Noskov, **A.V. Khait**, R.I. Ivanov, N.M. Anoshin, Investigation of the energy efficiency of the refrigeration system based on a double-circuit vortex tube, Akademicheskij vestnik UralNIIproekt RAASN, 3(2015), 77–81 (In Russian).  
<http://uniip.ru/jurnal/eng/archive>
5. A.S. Noskov, A.V. Lovtsov, **A.V. Khait**, Simulation of gas flow in Double-Circuit Ranque-Hilsch vortex tube, Computational Continuum Mechanics, 5(3), 2012, 313–321 (In Russian). [http://www2.icmm.ru/journal/index\\_en.htm](http://www2.icmm.ru/journal/index_en.htm)
4. A.S. Noskov, A.V. Lovtsov, **A.V. Khait**, Numerical simulation of the Ranque-Hilsch energy separation effect with the aim of increasing the energy characteristics of the vortex tube, Omsk Scientific Bulletin, 3(103), 2011, 182–186 (In Russian).  
<http://vestnik.omgtu.ru>

3. A.S. Noskov, V.N. Alekhin, A.V. Lovtsov, **A.V. Khait**, Energy efficiency of the climatic systems based on vortex tubes, Akademicheskij vestnik UralNIIproekt RAASN, 3, 2011, 73–77 (In Russian).  
<http://uniip.ru/jurnal/eng/archive>
2. A.S. Noskov, **A.V. Khait**, A.P. Butimova, S.Yu. Pleshkov, A.V. Lovtsov, Energy efficiency and economic feasibility of climate systems based on a vortex tubes, Magazine of Civil Engineering, 1(19), 2011, 17–23 (In Russian).  
<http://engstroy.spbstu.ru>
1. A.S. Noskov, A.V. Lovtsov, **A.V. Khait**, Numerical investigation of the gas flow structure in the nozzle of the vortex tube, Omsk Scientific Bulletin, 1(87), 2010, 74–77 (In Russian).  
<http://vestnik.omgtu.ru>

## Conference Proceedings with Peer Review

10. N. Anoshin, **A. Khait**, V. Bianco, A. Noskov, V. Alekhin, Deceleration of the Cold Flow in the Vortex Tube. IOP Conf. Ser.: Mater. Sci. Eng., 972 (2020), 012077  
<https://doi.org/10.1088/1757-899X/972/1/012077>
9. **A. Khait**, Z. Ma, L. Qian, W. Bai, Z. Lin, Energy Dissipation and Non-Potential Effects in Wave Breaking. Proceedings of the Thirtieth (2020) International Ocean and Polar Engineering Conference. Paper number ISOPE 2020-TPC-0369  
<https://www.onepetro.org/conference-paper/ISOPE-I-20-3186>
8. **A. Khait**, L. Shemer, Nonlinear generation of narrow-banded wave trains. ASME paper OMAE2019-95364. <https://doi.org/10.1115/OMAE2019-95364>
7. **A. Khait**, L. Shemer, Application of Boundary Element Method for Determination of the Wavemaker Driving Signal. ASME paper OMAE2018-77069  
<https://doi.org/10.1115/OMAE2018-77069>
6. **A. Khait**, L. Shemer, Wave energy dissipation in two-dimensional breakers. The 35th Israeli Conference on Mechanical Engineering - ICME 2018
5. **A. Khait**, A. Noskov, V. Alekhin, A. Antipin, Numerical simulation and visualization of air flow in Ranque-Hilsch vortex tube, Proceedings of the 13th International Conference on Construction Applications of Virtual Reality, 2013, 629–638, London, UK  
<http://itc.scix.net/data/works/att/convr-2013-64.pdf>
4. **A.V. Khait**, A.S. Noskov, V.N. Alekhin, A.V. Lovtsov, Mathematical simulation of Ranque-Hilsch vortex tube heat and power performances, Proceedings of the 14th International Conference on Computing in Civil and Building Engineering, 2012, Moscow, Russia
3. A. Noskov, V. Alekhin, **A. Khait**, Numerical investigation of Ranque-Hilsch energy separation effect, Proceedings of the 2nd International Conference on Mechanical Engineering, Materials and Energy, 2012, Dalian, China
2. A.S. Noskov, **A.V. Khait**, V.Yu. Engel, Towards the influence of the second prechamber on the axial-piston hydraulic machine operation, Proceedings of the International Conference on Dynamics and Vibroacoustics of Machines, 2012, 179-181, Samara, Russia (In Russian)

1. A.V. Lovtsov, A.S. Noskov, **A.V. Khait**, Optimization of vortex forming device used in Ranque-Hilsch vortex tubes, Proceedings of the 4th International Conference on Heat and Mass Transfer and Hydrodynamics in Vortex Flows, 2011, Moscow, Russia (In Russian)

## Citation Index

H-index (Google Scholar): 7

Total number of citations of all articles (Google Scholar): 253

## Lectures and Seminars

6. **A. Khait**, Generation and absorption of nonlinear water waves. Zoom seminar at the Institute of Computational Technologies, Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia. February 16, 2021.  
<http://www.ict.nsc.ru/ru/education/seminar/generaciya-absorbciya-nelineynyh-voln-vode>
5. **A. Khait**, Potential and non-potential effects in wave breaking. Zoom seminar at the department of Mechanical Engineering and Mechatronics, Ariel University, Israel. December 16, 2020. <https://www.ariel.ac.il/wp/me/en/2020/11/22/seminar-potential-and-non-potential-effects-in-wave-breaking>
4. **A. Khait**, Potential and non-potential effects in wave breaking. Zoom seminar at the School of Mechanical Engineering, Tel Aviv University, Israel. December 14, 2020.  
<https://en-engineering.tau.ac.il/me-seminar-14.12.2020>
3. **A. Khait**, Generation and absorption of nonlinear water waves. Seminar at the Department of Mathematics, Keele University, Staffordshire, UK. December 2, 2020, online due to COVID-19.
2. **A. Khait** and L. Shemer, Nonlinear generation of narrow and broad-banded wave trains by a wavemaker, CMMFA theme talk, Manchester Metropolitan University, UK, May 2019.
1. **A. Khait**, Application of the Boundary Element Method for investigation of nonlinear surface gravity waves in laboratory conditions, Seminar at School of Mechanical Engineering, Tel Aviv University, Israel, 2018.  
<https://engineering.tau.ac.il/me-seminar-11.6.18>

## Presentations at Meetings and Conferences

9. **A. Khait**, Z. Ma, L. Qian, W. Bai, Z. Lin, Energy Dissipation and Non-Potential Effects in Wave Breaking, ISOPE 2020, Shanghai, China. October 11–16, 2020. Online due to COVID-19
8. **A. Khait** and L. Shemer, Nonlinear generation of narrow-banded wave trains, ASME conference, OMAE 2019, Glasgow, Scotland, UK, 2019
7. **A. Khait** and L. Shemer, Application of Boundary Element Method for Determination of the Wavemaker Driving Signal, ASME conference, OMAE 2018, Madrid, Spain, 2018
6. **A. Khait** and L. Shemer, Wave energy dissipation in two-dimensional breakers, The 35th Israeli Conference on Mechanical Engineering ICME 2018, Beer-Sheva, Israel, 2018



5. **A. Khait** and L. Shemer, Validation of the kinematic wave-breaking criterion: experiments and BEM simulations, International conference WISE 2018, Tel Aviv, Israel, 2018
4. **A. Khait**, A. Noskov, V. Alekhin, A. Antipin, Numerical simulation and visualization of air flow in Ranque-Hilsch vortex tube, 13th International Conference CONVR 2013, London, UK, 2013
3. **A.V. Khait**, A.S. Noskov, V.N. Alekhin, A.V. Lovtsov, Mathematical simulation of Ranque-Hilsch vortex tube heat and power performances, 14th International Conference ICCBE 2012, Moscow, Russia, 2012
2. **A. Khait**, A. Noskov, V. Alekhin, Numerical investigation of Ranque-Hilsch energy separation effect, International Conference ICMEME 2012, Dalian, China, 2012
1. **A.V. Khait**, A.V. Lovtsov, A.S. Noskov, Optimization of vortex forming device used in Ranque-Hilsch vortex tubes, 4th International Conference on Heat and Mass Transfer and Hydrodynamics in Vortex Flows, Moscow, Russia, 2011

## Workshops

3. CCP-WSI Code Developers' Workshop, Online, 7th–8th April 2021  
[http://www.ccp-wsi.ac.uk/events/training/code\\_developers\\_workshop\\_2](http://www.ccp-wsi.ac.uk/events/training/code_developers_workshop_2)
2. CCP-WSI Focus Group Workshop, Online, 4th September 2020  
[http://www.ccp-wsi.ac.uk/events/industry\\_engagement/focus\\_group\\_workshop\\_3](http://www.ccp-wsi.ac.uk/events/industry_engagement/focus_group_workshop_3)
1. CCP-WSI Hackathon, Queen's University Belfast, 16th–20th September 2019  
<http://www.ccp-wsi.ac.uk/events/hackathons/portaferry2019>

## Patents

5. A.V. Lovtsov, **A.V. Khait**, Registration of the computer program n.2009612645, HyDrawGraph. Patentee: Design Bureau Chkz-Yugson
4. **A.V. Khait**, Registration of the computer program n.2009612646, HyDrawSim. Patentee: Design Bureau Chkz-Yugson
3. V.P. Syropyatov, A.V. Lovtsov, A.V. An, Yu.A. Kirsanov, **A.V. Khait**, Patent of Russian Federation n.2406952, Cyclic dryer of grains. Patentee: Design Bureau Chkz-Yugson
2. V.P. Syropyatov, A.V. Lovtsov, **A.V. Khait**, A.S. Pilnik, V.I. Chernoborodov, Patent of Russian Federation n.124367, Portable module of vapour generator with exhaust gas circulation. Patentee: Design Bureau Chkz-Yugson
1. A.V. Lovtsov, A.S. Noskov, V.P. Syropyatov, **A.V. Khait**, Patent of Russian Federation n.2533590, Vortex Tube. Patentee: Design Bureau Chkz-Yugson

## Teaching Aids and Books

3. A.V. Nekrasov, Fluid mechanics for architects and civil engineers, Ural Federal University, Ekaterinburg, 2020, 189 p. Scientific editor: **A.V. Khait**
2. S.Yu. Pleshkov, V.Yu. Engel, **A.V. Khait**, Design and typical schemes of hydraulic drive equipment, Ural Federal University, Ekaterinburg, 2011, 34 p.
1. S.Yu. Pleshkov, V.Yu. Engel, **A.V. Khait**, Design and the main working parameters of the hydraulic machines, Ural Federal University, Ekaterinburg, 2011, 30 p.