

Ing. Karel Řezáč, Ph.D

born in 1980 in Kladno, Czech Republic



Education

- 1998 – 2004 M.Sc. (Ing.) at Faculty of Electrical Engineering, Czech Technical University in Prague
- 2004 – 2011 Ph.D. course in Plasma Physics at Faculty of Electrical Engineering, Czech Technical University in Prague

Professional positions

- 2009 – up to now Assistant Professor: Faculty of Electrical Engineering, Czech Technical University in Prague (100%)
- 2011 – 2018 Researcher, Institute of Plasma Physics, Academy of Sciences, Czech Republic (10%)

Work experience

- skills X-ray, electron, ion, and neutron diagnostics of hot dense plasma, and other experimental skills gained at the laser and Z-pinch facilities (PFZ-200 in FEE CTU in Prague, PALS Ac.Sci. in Prague, IPPLM in Warsaw, PF-24 in IJF in Krakow, S-300 in KI in Moscow, GIT-12 in IHCE in Tomsk, Phelix in Darmstadt GSI, NTF in UN in Reno, HAWK in NRL in Washington DC), numerical simulations (Monte Carlo, optimization techniques). Design of diagnostic instruments – Computer-Aided Design.
- 2005 – up to now Member of the scientific group “High-current discharges” on FEE CTU in Prague (<http://www.fel.cvut.cz/en/research/teams/vyboje.html>)
- 2005 – up to now **Participant in 44 experimental campaigns in foreign countries (total 97 weeks):**
19x PF-1000 plasma focus, Institute of Plasma Physics and Laser Microfusion, Warsaw, Poland
3x S-300 Z-pinch, Russian Research Center Kurchatov Institute, Moscow, RF
11x GIT-12 pulsed power generator, Institute of High Current Electronics, Tomsk, RF
3x Phelix laser & Unilac heavy ion accelerator, GSI Darmstadt, Germany
Zebra pulsed power generator, NTF in UNR, Reno, USA
3x (6 weeks) HAWK pulsed power generator, NRL, Washington DC, USA
2x PF-24 plasma focus, Institute of Nuclear Physics PAN, Krakow, Poland
2x MAIZE in UN, Ann Arbor, USA
- 2007 – up to now Participant in 16 experimental campaigns in the Czech Republic on laser system PALS, IPP AS CR, Prague
- 2018 – up to now Reviewer of scientific journals (10x)
- 2015 – up to now Project Applications Reviewer (19x MEYS of the Czech Republic, 2x CONICYT Chile)
- 9/2024 – 5/2025 Fulbright-Masaryk Scholarship at the University of Michigan, USA.

Education skills

- 2005 – up to now Basic course of Physics on FEE CTU in Prague (bachelor and magister study program)
- 2007 – 2016 Astrophysics, optional course on CTU in Prague (bachelor and magister study program)
- 2010 – up to now Plasma diagnostics on FEE CTU in Prague (Ph.D. study program) and on FNŠP CTU in Prague (magister study program)
- 2010 – up to now Supervisor of 3 bachelor's (2 finished), 2 diploma (1 finished) thesis, and supervisor-specialist of 1 Ph.D. thesis (1 finished).
- 2016 – up to now Volunteer leadership of high school professional activities (SOČ in Czech), 4 students (45 individual seminars)

Membership in scientific societies and committee

- 2006 – up to now Member of American Physical Society (APS)
2021 Scientific committee member of Summer School of Plasma Diagnostics (PhDiaFusion 2021).

Organizational skills and competencies

- 2012, 2014 Coordinator of the diagnostic group on experiments in GSI, Darmstadt (Germany)
2018, 2020 Coordinator of the diagnostic group on experiments in NRL, Washington DC, USA
2011 – 2021 Preparation of experimental campaign on GIT-12 facility in Tomsk, Russian Federation
2019, 2021 Coordinator of 2 experimental campaigns on PF-24 plasma focus in Institute of Nuclear Physics PAN, Krakow, Poland
2016 – up to now Project investigator of 4 projects: 8JPL19014, SGS22/161/OHK3/3T/13, SGS19/167/OHK3/3T/13, SGS16/223/OHK3/3T/13

Technical skills and competencies

- 2008 – up to now Professional qualification – license of Practices Using Ionizing Radiation Sources (State Office for Nuclear Safety of Czech Republic)
2008 – up to now Responsible person for radiation protection (Laboratory with facility PFZ-200 in FEE CTU in Prague)

Professional honors, awards, and fellowships

- Individual Award of the Rector of the Czech Technical University for the excellent doctoral thesis "Reconstruction of Neutron Energy Spectra in Z-pinch Fusion Experiments" – 1st degree (2012)
Team Award of the Rector of the Czech Technical University for Excellence in Research – 2nd degree (2014)
Individual Fulbright-Masaryk Scholarship (2024)

Community service

- Member of the organization Junák – český skaut, z. s.
1993 – up to now Member – as a child (since 1993), then I was involved in the education of children (1995 – 1998), after that in auxiliary and elective positions
2005 – up to now Member or head of the audit committee (elected position) in the basic organizational unit of Junák – český skaut, z. s.
2003 – up to now Annual systematic assistance in organizing summer camps for youth – assistance with a program (since 2003), camp supply (since 2003), cook (since 2019)

Publications (according to Web of Science)

- up to October 2023 Number of all records: 111
The sum of the Times Cited: 1,092
The sum of Times Cited without self-citations: 572
H-index: 20

List of 10 last or significant papers

- [1] J. Novotny, J. Cikhardt, B. Cikhardtova, D. Klir, J. Kravarik, P. Kubes, J. Malir, V. Munzar, **K. Rezac**: *Effect of anode shape on neutron and x-ray emission in dense plasma focus*, Physic of Plasmas 30(8), 082702, DOI:10.1063/5.0153177, 2023.
[2] V. Munzar, D. Klir, J. Cikhardt, J. Kravarik, P. Kubes, J. Malir, J. Novotny, **K. Rezac**, et al.: *Mapping of azimuthal B-fields in Z-pinch plasmas using Z-pinch-driven ion deflectometry*, Physic of Plasmas 28(6), 062702, DOI:10.1063/5.0040515, 2021.

- [3] J. Cikhardt, D. Klir, A.V. Shishlov, V.A. Kokshenev, **K. Rezac**, et al.: *Neutron fluence distribution in experiments with 3 MA deuterium gas-puff z-pinch*, Physic of Plasmas 27(7), 072705, DOI:10.1063/5.0008108, 2020.
- [4] D. Klir, A. Shishlov, V. Kokshenev, P. Kubeš, **K. Rezac**, J. Kravárik, V. Munzar, J. Cikhardt, B. Cikhardtová, et al.: *Ion acceleration mechanism in mega-ampere gas-puff z-pinches*, New Journal of Physics, vol. **20**, no. 5, art. no. 053064, 2018.
- [5] D. Klir, A. Shishlov, V. Kokshenev, P. Kubeš, **K. Rezac**, J. Kravárik, V. Munzar, J. Cikhardt, B. Cikhardtová, et al.: *Ion acceleration mechanism in mega-ampere gas-puff z-pinches*, New Journal of Physics, vol. **20**, no. 5, art. no. 053064, 2018.
- [6] D. Klir, A. Shishlov, V. Kokshenev, P. Kubeš, A. Labetsky, **K. Rezac**, R. Cherzidov, J. Cikhardt, et al.: *Efficient generation of fast neutrons by magnetized deuterons in an optimized deuterium gas-puff z-pinch*, Plasma Physics and Controlled Fusion, **57**(4), art. no. 044005. ISSN 0741-3335, 2015. (Highlights of 2015, Cover image, LabTalk).
- [7] D. Klir, A. Shishlov, V. Kokshenev, P. Kubeš, A. Labetsky, **K. Rezac**, et al.: *Deuterium z-pinch as a powerful source of multi-MeV ions and neutrons for advanced applications*, Physics of Plasmas, vol. **23**, no. 3, art. no. 0327025, 2016. (Editor's Picks, Physics of Plasmas 2016. Most Read in March 2016.)
- [8] D. Klir, P. Kubes, **K. Rezac**, J. Cikhardt, et al.: *Efficient Neutron Production from a Novel Configuration of Deuterium Gas-Puff Z-Pinch*, Phys. Rev. Lett. **112**, 095001, 2014.
- [9] **K. Rezac**, D. Klir, P. Kubes and J. Kravarik: *Improvement of time-of-flight methods for reconstruction of neutron energy spectra from $D(d,n)^3\text{He}$ fusion reactions*. Plasma Phys. Control. Fusion **54**, 105011, 2012. (44 citations. Most read in June-July 2012.)
- [10] D. Klir, P. Kubes, M. Paduch, T. Pisarczyk, T. Chodukowski, M. Scholz, Z. Kalinowska, E. Zielinska, B. Bienkowska, J. Hitschfel, S. Jednorog, L. Karpinski, J. Kortanek, J. Kravarik, **K. Rezac**, I. Ivanova-Stanik, and K. Tomaszewski. *Experimental evidence of thermonuclear neutrons in a modified plasma focus*. Appl. Phys. Lett., **98**(7), 2011.