

Doppler Institute

for Mathematical Physics and Applied Mathematics

2007 List of Publications

(a) Research papers in journals

(a1) Accepted and published in 2007

1. Pavel Exner, Mario Helm, Peter Stollmann: Localization on a quantum graph with a random potential on the edges, *Rev. Math. Phys.* **19** (2007), 923–939.
2. Miloslav Znojil: Mass-sign duality of cubic oscillators, *Adv. Studies Theor. Phys.* **1** (2007), 405–408.
3. Āestmír Burdík, Severín Pošta, Ondřej Navrátil: Two-dimensional matrix Calogero models of the BC_2 type, *Yad. Fiz.* **70** (2007), 491–495.
4. Jaroslav Novotný, Gerd Alber, Igor Jex: Network implementation of covariant two-qubit quantum operations, *Phys. Rev.* **A75** (2007), 042309
5. Julien Bernat, Zuzana Masáková, Edita Pelantová: On a class of infinite words with affine factor complexity, *Theoret. Comp. Sci.* **389** (2007), 12–25.
6. Petr Luft, Goce Chadzitaskos, Jiří Tolar: Dihedral symmetry of periodic chain: quantization and coherent states, *J. Phys. A: Math. Theor.* **40** (2007), 4833–4845.
7. Pavel Exner, Olaf Post: Convergence of resonances on thin branched quantum wave guides, *J. Math. Phys.* **48** (2007), 092104
8. Pavel Exner, Martin Fraas, Evans M. Harrell: On the critical exponent in an isoperimetric inequality for chords, *Phys. Lett.* **A368** (2007), 1–6.
9. Pavel Exner, Ondřej Turek: Approximations of singular vertex couplings in quantum graphs, *Rev. Math. Phys.* **19** (2007), 571–606.
10. Miloslav Znojil: A return to observability near exceptional points in a schematic \mathcal{PT} -symmetric model, *Phys. Lett.* **B647** (2007), 225–230.
11. Miloslav Znojil: Determination of the domain of the admissible matrix elements in the four-dimensional \mathcal{PT} -symmetric anharmonic model, *Phys. Lett.* **A367** (2007), 300–306.

12. Miloslav Znojil: Maximal couplings in \mathcal{PT} -symmetric chain-models with the real spectrum of energies, *J. Phys. A: Math. Theor.* **40** (2007), 4863–4875.
13. Pavel Exner, Martin Fraas: A remark on helical waveguides, *Phys. Lett. A* **369** (2007), 393–399
14. Claudio Cacciapuoti, Pavel Exner: Nontrivial edge coupling from a Dirichlet network squeezing: the case of a bent waveguide, *J. Phys. A: Math. Theor.* **40** (2007), L511–L523.
15. Pavel Exner, Martin Fraas: On the dense point and absolutely continuous spectrum for Hamiltonians with concentric δ shells, *Lett. Math. Phys.* **82** (2007), 25–37.
16. Pavel Exner, Petr Šeba: A "hybrid plane" with spin-orbit interaction, *Russ. J. Math. Phys.* **14** (2007), 430–434.
17. P. Ambrož, Z. Masáková, E. Pelantová: Addition and multiplication of beta-expansions in generalized Tribonacci base, *Discrete Math. Theor. Comput. Sci.* **9** (2007), 73–88.
18. P. Kocábová, Z. Masáková, E. Pelantová: Ambiguity in the m-bonacci numeration system, *Discrete Math. Theor. Comput. Sci.* **9** (2007), 109–124.
19. C. Frougny, Z. Masáková, E. Pelantová: Infinite special branches in words associated with beta-expansions, *Discrete Math. Theor. Comput. Sci.* **9** (2007), 125–144.
20. Tamás Fülöp: Singular potentials in quantum mechanics and ambiguity in the self-adjoint Hamiltonian, *SIGMA* **3** (2007), 107
21. Mark Harmer: Two particles on a star graph I, *Russ. J. Math. Phys.* **14** (2007), 4350–439.
22. P. Šulc, J. Tolar: Group theoretical construction of mutually unbiased bases in Hilbert spaces of prime dimensions, *J. Phys. A: Math. Theor.* **40** (2007), 15099–15111.
23. Ondřej Turek: Balance properties of the fixed point of the substitution associated to quadratic simple Pisot numbers, *RAIRO: Theoretical Informatics and Applications* **41** (2007), 123–135.
24. Miloslav Znojil, Uwe Guenther: Dynamics of charged fluids and $1/L$ perturbation expansions, *J. Phys. A: Math. Theor.* **40** (2007), 7375–7388.

25. Miloslav Znojil: Conditional observability, *Phys. Lett.* **B650** (2007), 440–446.
26. Miloslav Znojil: Tridiagonal \mathcal{PT} -symmetric N by N Hamiltonians and a fine-tuning of their observability domains in the strongly non-Hermitian regime, *J. Phys. A: Math. Theor.* **40** (2007), 13131–13148.
27. Vít Jakubský: Thermodynamics of Pseudo-Hermitian systems in equilibrium, *Mod. Phys. Lett.* **A22** (2007), 1075–1084.

(a2) Accepted earlier, published in 2007

1. Pavel Exner, Martin Fraas: The decay law can have an irregular character, *J. Phys. A: Math. Theor.* **40** (2007), 1333–1340.
2. Pavel Exner, Takashi Ichinose, Hagen Neidhardt, Valentin Zagrebnev: Zeno product formula revisited, *Integral Equations and Operator Theory* **57** (2007), 67–81.
3. Petr Ambrož, Christiane Frougny, Zuzana Masáková, Edita Pelantová: Palindromic complexity of infinite words associated with simple Parry numbers, *Annales de l'Institut Fourier* **56** (2006), 2131–2160.
4. Petr Ambrož, Christiane Frougny: On α -adic expansions in Pisot bases, *Theoret. Comp. Sci.* **380** (2007), 266–275.
5. Petr Baláži, Zuzana Masáková, Edita Pelantová: Factor versus palindromic complexity of uniformly recurrent infinite words, *Theoret. Comp. Sci.* **380** (2007), 266–275.
6. T. Probst-Schendzielorz, A. Wolf, M. Freyberger, J. Bergou, I. Jex, Bing He: Unambiguous discriminator for unknown quantum states: An implementation, *Phys. Rev.* **A75** (2007), 052116
7. Ľubomíra Balková, Edita Pelantová, Ondřej Turek: Combinatorial and arithmetical properties of infinite words associated with non-simple quadratic Parry numbers, *RAIRO: Theoretical Informatics and Applications* **41** (2007), 307–328.
8. Jiří Patera, Edita Pelantová, Milena Svobodová: Fine gradings of the real forms of $sl(4, \mathbb{C})$, $sp(4, \mathbb{C})$, and $o(4, \mathbb{C})$, *J. Math. Phys.* **48** (2007), 093503
9. Manuel Lara, John L. Bohn, Daniel E. Potter, Pavel Soldán, Jeremy M. Hutson: Cold collisions of OH and Rb. I: the free collision, *Phys. Rev.* **A75** (2007), 012704

10. Pedro Freitas, David Krejčířík: Waveguides with combined Dirichlet and Robin boundary conditions, *Mathematical Physics, Analysis and Geometry* **9** (2006), 335–352.
11. Ondřej Lev, Pavel Štovíček: On a semiclassical formula for non-diagonal matrix elements, *Int. J. Theor. Phys.* **46** (2007), 2688–2707.
12. A. Tereszkieicz, A. Odziejewicz, M. Horowski, I. Jex, G. Chadzitaskos: Explicitly solvable models of two-mode coupler in Kerr-media, *Phys. Rev.* **A75** (2007), 063817
13. V. Košťák, G. Nikolopoulos, I. Jex: Perfect state transfer in networks of arbitrary topology and coupling configuration, *Phys. Rev.* **A75** (2007), 042319
14. Ladislav Hlavatý, Libor Šnobl: Poisson-Lie T-plurality as canonical transformation, *Nucl. Phys.* **B768** (2007), 209–218.
15. Tamás Fülöp, Izumi Tsutsui: Boundary effect of a partition in a quantum well, *J. Phys. A: Math. Theor.* **40** (2007), 4585–4608.
16. Milan Krbálek: Equilibrium distributions in thermodynamical traffic gas, *J. Phys. A: Math. Theor.* **40** (2007), 5813–5821.
17. Denis Borisov: Asymptotic behaviour of the spectrum of a waveguide with distant perturbation, *Mathematical Physics, Analysis and Geometry* **10** (2007), 155–196.
18. Pavel Exner: Unstable system dynamics: do we understand it fully?, *Rep. Math. Phys.* **59** (2007), 351–363.
19. Joachim Asch, Pavel Štovíček: Dynamics of a classical Hall system driven by a time dependent Aharonov-Bohm flux, *J. Math. Phys.* **48** (2007), 052901
20. Joachim Asch, Pavel Štovíček: On the dynamics created by a time dependent Aharonov-Bohm flux, *Rep. Math. Phys.* **59** (2007), 299–303.
21. Jeremy M. Hutson, Pavel Soldán: Molecular collisions in ultracold atomic gases, *Int. Rev. Phys. Chem.* **25** (2006), 497–596.
22. V.B. Belyaev, M. Tater, E. Truhlík: Influence of protons on the capture of electrons by the nuclei of ${}^7\text{Be}$ in the Sun, *Phys. Rev.* **C75** (2007), 034608
23. Pedro Freitas, David Krejčířík: Unbounded planar domains whose second nodal line does not touch the boundary, *Math. Res. Lett.* **14** (2007), 107–111.

(b) Accepted for publication in 2007

1. A. Gabris, T. Kiss, I. Jex: Scattering quantum random-walk search with errors, *Phys. Rev. A*, to appear; [quant-ph/0701150v3](#)
2. Petr Ambrož, Zuzana Masáková, Edita Pelantová: Matrices of 3iet preserving morphisms, *Theoret. Comp. Sci.*, to appear; [math.CO/0702336](#)
3. M. Štefanák, I. Jex, T. Kiss: Recurrence and Pólya number of quantum walks, *Phys. Rev. Lett.*, to appear; [arXiv: 0705.1991 \[quant-ph\]](#)
4. Pierre Duclos, Ondřej Lev, Pavel Štovíček: On the energy growth of some periodically driven quantum systems with shrinking gaps in the spectrum, *J. Stat. Phys.*, to appear; [arXiv: 0710.2331 \[math-ph\]](#)
5. Petr Ambrož: Matrices associated to 3-interval exchange transformation and their spectra, *Acta Polytechnica*, to appear
6. Jaroslav Smejkal, Vít Jakubský, Miloslav Znojil: Relativistic vector bosons and \mathcal{PT} -symmetry, *Journal of Physical Studies*, to appear; [hep-th/0611287](#)
7. Miloslav Znojil: \mathcal{PT} -symmetric quantum chain models, *Acta Polytechnica*, to appear
8. Miloslav Znojil: Quantum toboggans with two branch points, *Phys. Lett. A*, to appear; [0708.0087v1 \[quant-ph\]](#)
9. Jun-Hua Chen, Edita Pelantová, Miloslav Znojil: Classification of the conditionally observable spectra exhibiting central symmetry, *Phys. Lett. A* (2007), to appear; [arXiv: 0711.3947 \[math-ph\]](#)
10. Pedro Freitas, David Krejčířík: A sharp upper bound for the first Dirichlet eigenvalue and the growth of the isoperimetric constant of convex domains, *Proc. Amer. Math. Soc.*, to appear; [arXiv:0710.5475 \[math.SP\]](#)
11. J. Dittrich, V. I. Inozemtsev: The commutativity of integrals of motion for quantum spin chains and elliptic functions identities, *Regular and Chaotic Dynamics* (2008), to appear; [arXiv:0711.1973v1 \[math-ph\]](#)
12. Boris Shapiro, Miloš Tater: Root asymptotics of spectral polynomials, *Acta Polytechnica*, to appear
13. Daniel Gebert, Oliver Kern, Gernot Alber, Igor Jex: Stabilization of quantum information by combined dynamical decoupling and detected-jump error correction, *Eur. Phys. J.*, to appear

14. Pavel Exner, Petr Šeba: A Markov process associated with plot-size distribution in Czech Land Registry and its number-theoretic properties, *J. Phys. A: Math. Theor.* **41** (2008), to appear [arXiv: 0711.1836](#) [[physics.soc-ph](#)]

(c) Other papers, published and accepted in 2007

1. Zuzana Masáková, Edita Pelantová: Quasicrystals: algebraic, combinatorial and geometrical aspects, *Proceedings of NATO School "Physics and Computer Science – From Numbers and Languages to (Quantum) Cryptography", Security through Science Series: Information and Communication Security* (J.-P. Gazeau, J. Nešetřil, B. Rován, eds.), vol. 7, IOS Press (2007), pp. 113–131; [math-ph/0603065](#)
2. Pavel Exner, Jiří Lipovský: Equivalence of resolvent and scattering resonances on quantum graphs, in *"Adventures in Mathematical Physics" (Proceedings, Cergy-Pontoise 2006)*, *AMS "Contemporary Mathematics" Series* (F. Germinet, P.D. Hislop, eds.), vol. 447, Providence, R.I., 2007; pp. 73-81.; [math-ph/0610065](#)
3. Petr Ambrož, Lenka Háková, Edita Pelantová: A note on \mathfrak{S} iet preserving morphisms, *Proceedings WORDS 2007 (Marseille)* (P. Arnoux, N. Bedaride, J. Cassaigne, eds.), Institut de Mathematiques de Luminy 2007; pp. 18–24; [math.CO/0703792](#)
4. P. Exner, O. Post: Quantum networks modelled by graphs, *Proceedings of the Joint Mathematics/Physics Workshop "Quantum Few-Body System" (Aarhus 2007)*, to appear; [arXiv: 0706.0481](#) [[math-ph](#)]
5. V. Geyler, P. Štoviček, M. Tušek: A quantum dot with impurity in the Lobachevsky plane, *Proceedings of the 6th Workshop Operator Theory, Birkhaeuser OT series*, to appear; [arXiv: 0709.2790](#) [[math-ph](#)]
6. Goce Chadzitaskos: Coherent states on open finite chains, *Proceedings of "XXVI International Workshop on Geometrical Methods in Physics" (Bialowieza 2007)*, P. Kielanowski et al, eds., AIP Conference Proceedings, vol. 956, Springer 2007; pp. 240–244.

(d) Submitted in 2007, not yet accepted

1. David Krejčířík: Calculation of the metric in the Hilbert space of \mathcal{PT} -symmetric model via the spectral theorem, *submitted*; [arXiv:](#)

- 0707.1781 [math-ph]
2. Denis Borisov, David Krejčířík: \mathcal{PT} -symmetric waveguide, *submitted*; arXiv: 0707.3039 [math-ph]
 3. Pavel Exner: Leaky quantum graphs: a review, submitted to *Proceedings of the INI programme Analysis on Graphs and Applications (Cambridge 2007)*; arXiv: 0710.5903 [math-ph]
 4. Ľubomira Balková, Edita Pelantová, Wolfgang Steiner: Sequences with constant number of return words, submitted to *Monatshefte für Mathematik*
 5. Milena Svobodová: Fine gradings of low-rank complex Lie algebras and their real form, submitted to *Sigma, Proceedings of the Conference "Symmetry in Nonlinear Mathematical Physics"*
 6. Petr Baláží, Zuzana Masáková, Edita Pelantová: Characterization of substitution invariant 3iet words, submitted to *Integers*; arXiv: 0709.2638 [math.CO]
 7. P. Arnoux, V. Berthé, Z. Masáková, E. Pelantová: Sturm numbers and substitution invariance of 3iet words, submitted to *Integers*
 8. Ľubomira Balková, Edita Pelantová: A note on symmetries in the Rauzy graph and factor frequencies, submitted to *Theor. Comp. Sci.*
 9. Mark Harmer: Two particles on a star graph II, *submitted*; arXiv: 0711.3117 [math-ph]
 10. Petr Šeba: Parking in the city, *submitted*; arXiv: 0707.3924v3 [nlin.AO]
 11. Pavel Exner, Andrea Mantile: On the optimization of the principal eigenvalue for single-centre point-interaction operators in a bounded region, *submitted*; arXiv: 0711.4247 [math-ph]
 12. David Krejčířík, Miloš Tater: Non-Hermitian spectral effects in a \mathcal{PT} -symmetric waveguide, *submitted*
 13. David Krejčířík: Spectrum of the Laplacian in a narrow curved strip with combined Dirichlet and Neumann boundary conditions, *submitted*
 14. Pavel Exner, Sylwia Kondej: Hiatus perturbation for a singular Schrödinger operator with an interaction supported by a curve in \mathbb{R}^3 ; *submitted*; arXiv: 0712.0313 [math-ph]