

EVANS M. HARRELL

PUBLICATION LIST

27 May 2009

Preprints

On Riesz means of eigenvalues, preprint 2007, submitted (with L. Hermi).
arXiv:/0712.4088.

Universal bounds and semiclassical estimates for eigenvalues of abstract Schrödinger operators, preprint 2008, submitted (with J. Stubbe). arXiv:/0808.1133.

Trace identities for commutators, with applications to the distribution of eigenvalues, preprint 2008, submitted (with J. Stubbe). arXiv:/0903.0563.

On the maximization of a class of functionals on convex regions, and the characterization of the farthest convex set (with A. Henrot). arXiv:/0905.1464v1.

Refereed Publications

Universal inequalities for the eigenvalues of Laplace and Schrödinger operators on submanifolds, *Trans. Amer. Math. Soc.* **361**(2009)2337-2350 (with A. El Soufi and S. Ilias). arXiv: 0706.0910.

Eigenvalue inequalities for Klein-Gordon Hamiltonians, *J. Funct. Analysis* **256**(2009)3977-3995 (with S. Yıldırım Yolcu).

Differential inequalities for Riesz means and Weyl-type bounds for eigenvalues, *J. Funct. Analysis* **254**(2008)3173-3191 (with L. Hermi) arXiv:0705.3673.

On the critical exponent in an isoperimetric inequality for chords (with P. Exner and M. Fraas), *Physics Letters A* **368**(2007)1-6.

On the fundamental eigenvalue ratio of the p -Laplacian (with J. Fleckinger and F. de Thélin), *Bulletin des Sciences Mathématiques*, in press.

Commutators, eigenvalue gaps, and mean curvature in the theory of Schrödinger operators, *Commun. in Partial Diff. Eqs.* **32**(2007)401-413.

Perturbation theory and atomic resonances since Schrödinger's Time, p. 227-248 in: P. Deift, F. Gesztesy, P. Perry, and W. Schlag, eds., *Spectral Theory and Mathematical Physics: A Festschrift in Honor of Barry Simon's 60th Birthday*, *Proceedings of Symposia in Pure Mathematics*, **76.1**, 2007.

Geometric lower bounds for the spectrum of elliptic PDEs with Dirichlet conditions in part, *J. Comput. Appl. Math.* **194**(2006)26-35.

Inequalities for means of chords, with application to isoperimetric problems (with P. Exner and M. Loss), *Letters in Math. Phys.* **75**(2006)225-233. Addendum, *Ibid.*, **77**(2006)219.

Double jeopardy: Defending MOSFET technology at the nanoscale court, *IEEE Circuits and Devices Magazine* **19**(1) (2003)28-34 (with Q. Chen, K. A. Bowman, E.M. Harrell, and J.D. Meindl).

A physical short-channel threshold voltage model for undoped symmetric double-gate MOSFET's, *IEEE Transactions on Electron Devices* **50**(2003)1631-1637 (with Q. Chen and J.D. Meindl), 2003.

A direct proof of a theorem of Blaschke and Lebesgue, *J. Geom. Anal.* **12**(2002), 81-88.

Asymptotics for solutions of some nonlinear partial differential equations on unbounded domains (with J. Fleckinger and F. de Thélin), *Electronic Journal of Differential Equations* **2001**(2001) No. 77, pp. 1-14.

On the placement of an obstacle or a well so as to optimize the fundamental eigenvalue (with P. Kröger and K. Kurata), *SIAM J. Math. Analysis* **33**(2001)240-259.

Optimal eigenvalues for some Laplacians and Schrödinger operators depending on curvature (with P. Exner and M. Loss), pp. 47-58 in: *Mathematical Results in Quantum Mechanics*, J. Dittrich, P. Exner, M. Tater, eds. Basel: Birkhäuser, 1999.

Boundary behavior and L^q estimates for solutions of equations containing the p -Laplacian (with J. Fleckinger and F. de Thélin), *Electronic Journal of Differential Equations* **1999**(1999) No. 38, pp. 1-19.

On the Laplace operator penalized by mean curvature (with M. Loss), *Commun. Math. Phys.*, **195**(1998)643-650.

On Trace Identities and Universal Eigenvalue Estimates for Some Partial Differential Operators (with J. Stubbe), *Trans. Amer. Math. Soc.*, **349**(1997)1797-1809.

On the Second Eigenvalue of the Laplace Operator Penalized by Curvature, *J. Differential Geom. Appl.* **6**(1996)397-400.

Commutator Bounds for Eigenvalues, with Applications to Spectral Geometry (with P.L. Michel), *Commun. in Partial Diff. Eqs.* **19**(1994)2037-2055. Erratum 20(1995)1453.

Commutator Bounds for Eigenvalues of Some Differential Operators (with P.L. Michel), pp. 235-244 in G. Ferreyra, G. Goldstein, and F. Neubrander, eds., *Evolution Equations*. New York: Marcel Dekker, 1994.

Some Geometric Bounds on Eigenvalue Gaps, *Commun. in Partial Diff. Eqs.* **18**(1993)179-198.

On Minimal and Maximal Eigenvalue Gaps and Their Causes, *Pac. J. Math.* **147**(1991)1-24 (with M.S. Ashbaugh and R. Svirsky).

Instabilities and Chaos in Intracavity Doubled Lasers, II, *Phys. Rev. A* **41**(1 March 1990)2778-2790 (with G.E. James and R. Roy).

On the Elimination of Chaos in an Intracavity Doubled Nd:YAG Laser, *Optics Letters*, **15**(1990)1141-1143 (with G.E. James, C. Bracikowski, R. Roy, and K. Wiesenfeld).

Instabilities and Chaos in Intracavity Doubled Lasers, *Coherence and Quantum Optics VI*, 559-563, J.H. Eberly, L. Mandel, E. Wolf, eds. (with G.E. James and R. Roy). New York: Plenum, 1989.

General Bounds for the Eigenvalues of Schrödinger Operators, pp. 146-166 in *Maximum Principles and Eigenvalue Problems in Partial Differential Equations*, P.W. Schaefer, editor. Essex, England: Longman House, and New York: Wiley, 1988

On the Density of States for Some Banded Matrices, *Constructive Approx.* **4**(1988)403-417 (with J. Geronimo and W. Van Assche).

Conformally Flat Riemannian Metrics, Schrödinger Operators, and Semiclassical Approximation, *J. Diff. Eq.* **66**(2) (1987)165-188 (with E.B. Davies).

L^2 estimates for Galerkin Methods for Semilinear Elliptic Equations, *SIAM J. Num. Anal.* **24**(1) (1987)52-58 (with W.J. Layton).

Maximal and Minimal Eigenvalues and Their Associated Nonlinear Equations, *J. Math. Phys.* **28**(8) (1987)1770-1786 (with M.S. Ashbaugh).

On the Extension of Ambarzumian's Inverse Spectral Theorem to Compact Symmetric Spaces, *Amer. J. Math.* **109**(1987)787-795.

Hamiltonian Operators with Maximal Eigenvalues, *J. Math. Phys.* **25**(1984)48-51.
Erratum Ibid. **27**(1986)419.

The $1/R$ Expansion for H_2^+ : Calculation of Exponentially Small Terms and Asymptotics, *Phys. Rev. A* **33**(1986)12-54 (with H.J. Silverstone, R.J. Damburg, R. Kh. Propin, S. Graffi, V. Grecchi, J. Cížek, J. Paldus, S. Nakai and J. Harris).

Potentials Producing Maximally Sharp Resonances, *Trans. Amer. Math. Soc.* **293**(1986)723-736 (with R. Svirsky).

The $1/R$ Expansion for H_2^+ : Analyticity, Summability, and Asymptotics, *Ann. Phys.* (N.Y.) **165**(1985)441-483 (with S. Graffi, V. Grecchi, and H.J. Silverstone).

Les Potentiels les Plus Resonnants, pp. 67-69 in: *Comptes-Rendus du Colloque sur les Méthodes Semiclassiques en Mécanique Quantique*, CIRM, 1984, B. Helffer and D. Robert, eds. Nantes: Univ. de Nantes, 1985.

$1/R$ Expansion for H_2^+ : Analyticity, Summability, Asymptotics, and Calculation of Exponentially Small Terms, *Phys. Rev. Lett.* **52**(1984)1112-1115 (with R.J. Damburg, R. Kh. Propin, S. Graffi, V. Grecchi, J. Cížek, J. Paldus, and H.J. Silverstone).

Potentials Producing Extremal Eigenvalues Subject to p-Norm Constraints, in: *Proceedings of the 1984 Conference on Ordinary Differential Equations*, Argonne National Laboratories Report 84-73 (1984) 19-29 (with M.S. Ashbaugh).

The Mathematical Theory of Resonances whose Widths are Exponentially Small, II. *J. Math. Anal. Appl.*, **9**(1984)447-457 (with N. Corngold and B. Simon).

Schrödinger Operator Methods in the Study of a Certain Nonlinear PDE. *Proc. Amer. Math. Soc.* **88**(1983)376-377. (With B. Simon)

On the Double-Well Problem for Dirac Operators, *Ann. de l'Inst. H. Poincaré* **38** (1983) 153-166 (with M. Klaus).

General Lower Bounds for Resonances in One Dimension. *Commun. Math. Phys.*, **86**(1982)221-225.

Perturbation Theory for Shape Resonance and Large Barrier Potentials. *Commun. Math. Phys.* **83**(1982)151-170 (with M. Ashbaugh).

Estimating Tunneling Phenomena. *Intl. J. Quantum Chem.* **21**(1982)199-207.

Inverse Scattering for the One-Dimensional Stark Effect, and Application to the Cylindrical KdV Equation. *Ann. de l'Inst. H. Poincaré* **34**(1982)41-58 (with S. Graffi).

High-Order Perturbation Theory of the Resonance Eigenvalues in the Stark Effect in Hydrogen and of the Anharmonic Oscillator with Negative Anharmonicity. *Phys. Rev. A* **24**(1981)1925-1934 (with H.J. Silverstone and C. Grot).

On the Effect of the Boundary Conditions on the Eigenvalues of Ordinary Differential Equations. In: *Contributions to Analysis and Geometry*, *Amer. J. Math. Suppl.*, D.N. Clark, G. Pecelli, and R. Sacksteder, eds. Baltimore and London: Johns Hopkins Press, 1981.

The Mathematical Theory of Resonances whose Widths are Exponentially Small. *Duke Math. J.* **47**(1980)845-892 (with B. Simon).

Double Wells. *Commun. Math. Phys.* **75**(1980)239-261.

The Band-Structure of a One-Dimensional, Periodic System in a Scaling Limit. *Ann. Phys. (N.Y.)* **119**(1979)351-369.

Bender-Wu Formula and the Stark Effect in Hydrogen. *Phys. Rev. Lett.* **42**(1979)704-707. Erratum 1430 (with L. Benassi, V. Grecchi, and B. Simon).

Oppenheimer's Formula, pp. 38-39 in: *Mathematical Properties of Schrödinger operators and Wavefunctions*, J. Hinze, ed., 1979 (1978 ZiF Bielefeld Workshop proceedings)

Generalizations of Temple's Inequality. *Proc. Amer. Math. Soc.* **69**(1978)271-276.

On the Rate of Asymptotic Eigenvalue Degeneracy. *Commun. Math. Phys.* **60**(1978)73-95.

Singular Perturbation Potentials. *Ann. Phys. (N.Y.)* **105**(1977)379-406.

Ph.D. thesis: Schrödinger Operators with Singular Perturbation Potentials. Princeton University, October, 1976.

Other scholarly works

Books translated (from German):

W. Thirring, *A Course in Mathematical Physics*, in four volumes. New York: Springer.

Vol. I: *Classical Dynamical Systems*, 1978, second edition 1992, third edition 1997.

Vol. II: *Classical Field Theory*, 1979, second edition 1986, third edition 1997.

Vol. III: *Quantum Mechanics of Atoms and Molecules*, 1981.

Vol. IV: *Quantum Mechanics of Large Systems*, 1982.

Books edited:

Advances in Differential Equations and Mathematical Physics. Providence: American Mathematical Society, 1997 (with E. Carlen and M. Loss).

Differential Equations with Applications to Mathematical Physics, Mathematics in Science and Engineering **102**. Boston: Academic Press, 1993 (with W.F. Ames and J.V. Herod).

Solicited reports and book reviews:

How to Win a Fellowship for Graduate Study in Mathematics, *Math Horizons* **12**(2004)15. (with M. Lacey).

B. Thaller, Visual Quantum Mechanics, *SIAM Review* **39** (2)(2001)385-388.

V.P. Maslov, The Complex WKB Method for Nonlinear Equations I, *SIAM Review* **38**(1996)168-171

A Report from the Front of the "Science Wars" - The Controversy over the Book *Higher Superstition* by Gross and Levitt and the Recent Articles by Sokal, *Notices of the Amer. Math. Society*, **43**(Oct., 1996)1132-1136.

Peter Kuchment, Floquet Theory for Partial Differential Equations, *Bull. Amer. Math. Soc.* **32**(1995)158-162.

Estimating the Risks of Producing Energy, pp. 57-78 in R. Howes, and A. Fainberg eds., *The Energy Source Book*, American Institute of Physics, 1990. (A study sponsored by the American Physical Society's *Forum on Physics and Society*.)

Civil Defense in Other Countries, pp. 105-119, and Postscript: Civil Defense During the Chernobyl Disaster, pp. 119-124 in J. Dowling and E. Harrell, eds., *Civil Defense: A Choice of Disasters*. New York: American Institute of Physics, 1987. (A study sponsored by the American Physical Society's *Forum on Physics and Society*.)

M.S.P. Eastham and H. Kalf, Schrödinger-Type Operators with Continuous Spectra. *Bull. Amer. Math. Soc.* **10**(1984)311-315.

Electronic texts:

Dynamical Systems and Chaos, class notes (84 pages text), copyright 1992, 1997, available at <http://mathphysics.com/pde/> .

Linear Methods of Applied Mathematics (with James V. Herod), hypertextbook at <http://mathphysics.com/pde/>, including Mathematica notebooks, Maple worksheets, and other materials, copyright 1994, 1997, 2000. (This book is accessed by several thousand distinct servers in a typical month.)