

Curriculum Vitae

Personal data

Name: Emil Fredrik Lundh
 Institute: Department of Physics
 Umeå University
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 Date of birth: December 31, 1970
 Place of birth: Lycksele
 Marital status: Married
 Citizen: Swedish

Education

1986-1989	Gymnasium, Natural Sciences programme
1991-1996	Studies at Umeå University. Mathematics and Natural Sciences programme, specialization in Physics
1995-1996	Master of Science thesis at University of Copenhagen. Supervisor: Prof. Henrik Smith. Title of thesis: <i>Bose-Einstein Condensation of trapped atomic systems: Ground-state properties and vortices</i>
September 30, 1998	Degree of Master of Science with a major in physics
Sep. 23 1996 - Dec. 31 2001	PhD student in Theoretical Physics, Umeå University. Supervisor: Dr. Ping Ao (Sep. 23, 1996 – Aug. 31, 2000); Prof. Jørgen Rammer (Aug. 31, 2000 – Dec. 31, 2001)
December 9, 1998	Licentiate degree in Theoretical Physics. Title of thesis: <i>Ground-state properties and vortices in trapped Bose-Einstein-condensed atomic systems</i>
December 19, 2001	Doctoral degree in Theoretical physics. Title of thesis: <i>Ground state and excitations in trapped Bose-Einstein Condensates</i>

Employment

Dec. 1, 1996 - Dec. 31, 2001	PhD-student position at Umeå University
Jan. 1, 2002 - Jul. 31, 2003	Postdoctoral researcher at Helsinki Institute of Physics, financed by the European Union network “Cold Atoms and Ultra-Precise Atom Clocks” (CAUAC)
Aug. 1, 2003 - July 31, 2005	Postdoctoral researcher at the Condensed Matter Theory group, Royal Institute of Technology (KTH)
Aug. 1, 2005 - Jan. 31, 2006	Postdoctoral researcher at Center of Mathematics for Applications, Oslo University
Feb. 1, 2006 -	Assistant professor (Forskarassistent) at the Physics Department, Umeå University, financed by Vetenskapsrådet

Participation in scientific conferences

Invited speaker at the “7th International Workshop on Atom Optics and Interferometry”, Lunteren, Netherlands, Sep. 28-Oct. 2, 2002. Title of talk: *Cold alkaline-earth collisions beyond the weak-field limit*

Invited speaker at the “Second International Workshop: Theory of Quantum Gases and Quantum Coherence”, Levico, Italy, Jun. 12-14, 2003. Title of talk: *Trapped attractive Bose gases under rotation*

Invited speaker at *Nordic Project Meeting: Manipulating Atomic Matter*, Copenhagen, Jan. 12-14, 2005. Title of talk: *Phases of rotating clouds in anharmonic traps*.

Teaching experience

Courses taught at Umeå University:

Wave physics and Optics (lecturer)
 Simulation Techniques (lecturer)
 Particle Physics (lecturer)
 Quantum Electronics (computer labs)
 Quantum Mechanics (teaching assistant)
 Quantum Mechanics (labs)

Numerical Methods in Physics (computer labs)

Physics Basic Course I (lecturer)

Mechanics (teaching assistant)

Linear Algebra (teaching assistant)

Calculus (teaching assistant)

Algebra (teaching assistant)

Publications

Emil Lundh, *Construction of a giant vortex state in a trapped Fermi system*, New J. Phys. **8** 304.

Emil Lundh and Halvor M. Nilsen, *Dynamical stability of a doubly quantized vortex in a three-dimensional condensate*, Phys. Rev. A **74**, 063620 (2006).

Laura Urba, Anders Rosengren and Emil Lundh, *One-dimensional extended Bose-Hubbard model with a confining potential: a DMRG analysis*, J. Phys. B: At. Mol. Opt. Phys. **39** (2006).

J. Piilo, E. Lundh, and K.-A. Suominen, *Cold collisions in strong laser fields: partial wave analysis of magnesium collisions*, Eur. Phys. J. D **40**, 211-222 (2006).

Emil Lundh, *Directed transport and Floquet analysis for a periodically kicked wavepacket at a quantum resonance*, Phys. Rev. E **74**, 016212 (2006).

A. D. Jackson, G. M. Kavoulakis, and E. Lundh, *Stability of the solutions of the Gross-Pitaevskii equation*, Phys. Rev. A **72**, 053617 (2005).

Emil Lundh and Mats Wallin, *Ratchet effect for cold atoms in an optical lattice*, Phys. Rev. Lett. **94**, 110603 (2005).

Emil Lundh, *Calculation of collective modes for the Bose-Hubbard model with confinement*, Phys. Rev. A **70**, 061602(R) (2004).

Emil Lundh, *Dipole and monopole modes in the Bose-Hubbard model in a trap*, Phys. Rev. A **70**, 033610 (2004).

A. Collin, E. Lundh, and K.-A. Suominen, *Center of mass rotation and vortices in an attractive Bose gas*, Phys. Rev. A **71**, 023613 (2005).

A. D. Jackson, G. M. Kavoulakis, and E. Lundh, *Phases of a rotating Bose-Einstein condensate with anharmonic confinement*, Phys. Rev. A **69**, 053619 (2004).

J. Piilo, E. Lundh, and K.-A. Suominen, *Radiative collisional heating at the Doppler limit for laser-cooled magnesium atoms*, Phys. Rev. A **70**, 013410 (2004).

E. Lundh, A. Collin, and K.-A. Suominen, *Rotational states of Bose gases with attractive interactions in anharmonic traps*, Phys. Rev. Lett. **92**, 070401 (2004).

Emil Lundh, J.-P. Martikainen, and K.-A. Suominen, *Vortex nucleation in Bose-Einstein condensates in time-dependent traps*, Phys. Rev. A **67**, 063604 (2003).

Emil Lundh and J. Rammer, *Effective-action approach to a trapped Bose gas*, Phys. Rev. A **66**, 033607 (2002).

Emil Lundh, *Multiply quantized vortices in trapped Bose-Einstein condensates*, Phys. Rev. A **65**, 043604 (2002).

Emil Lundh and P. Ao, *Hydrodynamic approach to vortex lifetimes in trapped Bose condensates*, Phys. Rev. A **61**, 63612 (2000).

Emil Lundh and P. Ao, *Hydrodynamic approach to vortex stability in trapped Bose condensates*, Physica B **284-288**, 19 (2000).

Emil Lundh, C. J. Pethick, and H. Smith, *Vortices in Bose-Einstein-Condensed Atomic Clouds*, Phys. Rev. A **58**, 4816 (1998).

Emil Lundh, C. J. Pethick, and H. Smith, *Zero-temperature properties of a trapped Bose-condensed gas: Beyond the Thomas-Fermi approximation*, Phys. Rev. A **55**, 2126 (1997).