

PUBLICATIONS – JOACHIM BRAND

Journal articles

1. B. Opanchuk, R. Polkinghorne, O. Fialko, **J. Brand**, P. D. Drummond, Quantum simulation of the early universe, *Ann. Phys. (Berlin)* **525**, 866-876 (2013).
2. S.-W. Su, S.-C. Gou, A. Bradley, O. Fialko, **J. Brand**, Kibble-Zurek scaling and its breakdown for spontaneous generation of Josephson vortices in Bose-Einstein condensates, *Phys. Rev. Lett.* **110**, 215302 (2013).
3. A. Cetoli, **J. Brand**, R. G. Scott, F. Dalfovo, L. P. Pitaevskii, Snake instability of dark solitons in fermionic superfluids, *Phys. Rev. A* **88**, 043639 (2013).
4. J. J. Cooper, D. W. Hallwood, J. A. Dunningham, **J. Brand**, Robust quantum enhanced phase estimation in a multimode interferometer, *Phys. Rev. Lett.* **108**, 130402 (2012).
5. O. Fialko, M.-C. Delattre, **J. Brand**, A. R. Kolovsky, Nucleation in finite topological systems during continuous metastable quantum phase transitions, *Phys. Rev. Lett.* **108**, 250402 (2012).
6. R. G. Scott, F. Dalfovo, L. P. Pitaevskii, S. Stringari, O. Fialko, R. Liao, **J. Brand**, The decay and collisions of dark solitons in superfluid Fermi gases, *New J. Phys.* **14**, 023044 (2012).
7. O. Fialko, A. S. Bradley, **J. Brand**, Quantum tunneling of a vortex between two pinning potentials, *Phys. Rev. Lett.* **108**, 015301 (2012).
8. A. Yu. Cherny, J.-S. Caux, **J. Brand**, Theory of superfluidity and drag force in the one-dimensional Bose gas, *Frontiers of Physics* **7**, 54 (2012).
9. R. Liao, **J. Brand**, Traveling Dark Solitons in Superfluid Fermi Gases, *Phys. Rev. A* **82**, 041604(R) (2011).
10. D. W. Hallwood, **J. Brand**, Engineering mesoscopic superpositions of superfluid flow, *Phys. Rev. A* **84**, 043620 (2011).
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12. T. Ernst, D. W. Hallwood, J. Gulliksen, H.-D. Meyer, **J. Brand**, Simulating strongly correlated multiparticle systems in a truncated Hilbert space, *Phys. Rev. A* **84**, 023623 (2011).
13. D. W. Hallwood, T. Ernst, **J. Brand**, Robust Mesoscopic Superposition of Strongly Correlated Ultracold Atoms, *Phys. Rev. A* **82**, 063623 (2010).
14. R. Liao, **J. Brand**, Anisotropic Superfluidity in the Two-Species Polar Fermi Gas, *Phys. Rev. A* **82**, 063624 (2010).
15. T. Ernst, **J. Brand**, Resonant trapping in the transport of matter-wave solitons through a quantum well, *Phys. Rev. A* **81**, 033614 (2010).
16. **J. Brand**, T. J. Haigh, U. Zülicke, Sign of coupling in barrier-separated Bose-Einstein condensates and stability of double-ring systems, *Phys. Rev. A*, **81**, 025602 (2010).
17. **J. Brand**, T. J. Haigh, U. Zülicke, Rotational fluxons of Bose-Einstein condensates in coplanar double-ring traps, *Phys. Rev. A*, **80**, 011602(R) (2009), selected for *Virtual Journal of Atomic Quantum Fluids*, <http://www.vjaqf.org>.
18. A. Yu. Cherny, J.-S. Caux, **J. Brand**, Decay of superfluid currents in the interacting one-dimensional Bose gas, *Phys. Rev. A*, **80**, 043604 (2009), selected for *Virtual Journal of Atomic Quantum Fluids*, <http://www.vjaqf.org>.
19. A. Yu. Cherny, **J. Brand**, Dynamic and static density-density correlations in the one-

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20. **J. Brand**, S. Flach, V. Fleurov, L. S. Schulmann, D. Tolkunov, Localization by entanglement, *Europhys. Lett.*, 83, 40002 (2008)
 21. R. A. Vicencio, **J. Brand**, S. Flach, Fano blockade by a Bose-Einstein condensate in an optical lattice, *Phys. Rev. Lett.* 98, 184102(2007)
 22. **J. Brand** and A. R. Kolovsky, Emergence of superfluid transport in a dynamical system of ultra-cold atoms, *Europhys. J. D*41, 331 (2007)
 23. A. Yu. Cherny and **J. Brand**, The polarizability and dynamic structure factor of the 1D Bose gas near the Tonks-Girardeau limit at finite temperatures, *Phys. Rev. A* 73, 023612 (2006)
 24. S. Sinha, A. Yu. Cherny, D. Kovrizhin, and **J. Brand**, Friction and diffusion of matter-wave bright solitons, *Phys. Rev. Lett.* 96, 030406 (2006).
 25. Ch. Lee and **J. Brand**, Enhanced quantum reflection of matter-wave solitons, *Europhys. Lett.* 73, 321 (2006); recognised as one of the 10 most cited papers of the year 2006 in EPL.
 26. S. Komineas and **J. Brand**, Collisions of solitons and vortex rings in cylindrical Bose-Einstein condensates, *Phys. Rev. Lett.* 95, 110401 (2005)
 27. N. S. Ginsberg, **J. Brand**, and L. V. Hau, Observation of Hybrid Soliton Vortex-Ring Structures in Bose-Einstein Condensates, *Phys. Rev. Lett.* 94, 040403 (2005); highlighted in Physics News Update and Physics Today.
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 32. L. D. Carr and **J. Brand**, Spontaneous soliton formation and modulational instability in Bose-Einstein condensates, *Phys. Rev. Lett.* 92, 040401 (2004).
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 35. L. D. Carr, **J. Brand**, S. Burger, and A. Sanpera, Dark soliton creation in Bose-Einstein condensates, *Phys. Rev. A*, 63 (2001) 051601(R).
 36. **J. Brand** and W. P. Reinhardt, Generating ring currents, solitons, and vortices by stirring a Bose-Einstein condensate in a toroidal trap, *J. Phys. B: At. Mol. Opt. Phys.*, 34 (2001) L113-L119.
 37. **J. Brand**, L. S. Cederbaum, and H.-D. Meyer, The dynamical Green's function and an exact optical potential for electron-molecule scattering including nuclear dynamics, *Phys. Rev. A*, **60**, 2983 (1999).
 38. E. Pahl, **J. Brand**, L. S. Cederbaum, and F. Tarantelli, Impact of narrow-band excitation on resonant decay spectra. *Phys. Rev. A* **60**, 1079 (1999).
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Book chapters

41. **J. Brand**, L. D. Carr, B. P. Anderson, Experiments on Multidimensional Solitons, in "Emergent Nonlinear Phenomena in Bose-Einstein Condensates: Theory and Experiment," edited by P. G. Kevrekidis, D. J. Frantzeskakis, and R. Carretero-Gonzalez (Springer Berlin Heidelberg 2008), DOI 10.1007/978-3-540-73591-5_8

42. L. D. Carr, **J. Brand**, Multidimensional Solitons: Theory, in "Emergent Nonlinear Phenomena in Bose-Einstein Condensates: Theory and Experiment," edited by P. G. Kevrekidis, D. J. Frantzeskakis, and R. Carretero-Gonzalez (Springer Berlin Heidelberg 2008), DOI 10.1007/978-3-540-73591-5_7
43. **J. Brand** and L. S. Cederbaum, Theory of extended two-particle Green's functions. *Adv. Quant. Chem.* **38**, 60 (2000).

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44. A. Yu. Cherny, **J. Brand**, Approximate expression for the dynamic structure factor in the Lieb-Liniger model, *J. Phys.: Conf. Ser.* 129, 012051 (2008).
45. **J. Brand**, A density-functional approach to fermionization in the 1D Bose gas, *J. Phys. B: At. Mol. Opt. Phys.* 37, S287-S300 (2004).

Others

46. **J. Brand**, Solitonenkollisionen im Bose-Einstein-Kondensat, *Physik in unserer Zeit* 36(3), 110 (2005) [popular science article in German]
47. **J. Brand** [co-author], "Dissipative Solitonen" and "Nichtlineare Schrodinger Gleichung" in Bronstein, Semendjajev, Musiol, Muhlig, *Taschenbuch der Mathematik*, 7th ed. (Harri Deutsch, Frankfurt a. M., 2008) [contribution to widely used reference book of mathematical formulas]