

Selected Abstracts from Other Physical Review Journals

Abstracts of papers that are published in other Physical Review journals and may be of interest to Physical Review A readers are printed below.

Multibox strategy for constructing highly accurate bound-state wave functions for three-body systems. Alexei M. Frolov, *Department of Physics, University of Windsor, Windsor, Ontario, Canada N9B 3P4*. (Received 11 April 2001; published 30 August 2001)

Variational, multibox approach is proposed to construct extremely accurate, bound-state wave functions for arbitrary three-body systems. The high efficiency of our present approach is based on an optimal choice of nonlinear parameters in the exponential basis functions. The proposed method is very flexible, since the final wave function can also include a large number of separately optimized cluster fragments. The wave functions obtained are very compact and highly accurate. Such wave functions can be used to compute various bound state properties for different three-body systems. The proposed approach has been successfully tested on a large number of actual systems. It is shown that the present approach can be used to solve various three-body problems with, in principle, arbitrary precision. In particular, the long-standing problem of highly accurate determination of the weakly bound (1,1) states in the $dd\mu$ and $dt\mu$ muonic molecular ions has finally been solved. The determined binding energies are $-1.974\,988\,088\,0 \pm 5 \times 10^{-10}$ eV and $-0.660\,338\,74 \pm 1 \times 10^{-8}$ eV, respectively. [Phys. Rev. E **64**, 036704 (2001)]

Chaos in a double driven dissipative nonlinear oscillator. H. H. Adamyan, S. B. Manvelyan, and G. Yu. Kryuchkian, *Yerevan State University, Manoosyan 1, Yerevan, 375049, Armenia, and Institute for Physical Research, National Academy of Sciences, Ashtarak-2, 378410, Armenia*. (Received 27 November 2000; published 25 September 2001)

We propose an anharmonic oscillator driven by two periodic forces of different frequencies as a time-dependent model for investigating quantum dissipative chaos. Our analysis is done in the framework of the statistical ensemble of quantum trajectories in a quantum state diffusion approach. The quantum dynamical manifestations of chaotic behavior, including the emergence of chaos, properties of strange attractors, and quantum entanglement, are studied by numerical simulation of the ensemble averaged Wigner function and von Neumann entropy. [Phys. Rev. E **64**, 046219 (2001)]

Experimental observation of spectral oscillations in frequency modulation laser operation. Stefano Longhi, *Istituto Nazionale di Fisica per la Materia, Dipartimento di Fisica and CEQSE-CNR, Politecnico di Milano, Piazza Leonardo da Vinci 32, I-20133 Milano, Italy*. (Received 4 May 2001; published 24 September 2001)

The experimental observation of transient coherent oscillations in the optical frequency spectrum of an Er–Yb solid-state laser with internal frequency modulation (FM) is reported. These oscillations, which arise in the presence of a slight detuning between the modulation frequency and the cavity axial mode separation, are transiently observed when the modulator is switched on and appear as a damped breathing of laser spectral width superimposed to the relaxation oscillation dynamics of the laser intensity. The experimental results are in good agreement with the theoretical predictions which take into account both the fast dynamics of spectral oscillations and the slow dynamics of relaxation oscillations for the codoped Er–Yb laser system. [Phys. Rev. E **64**, 047201 (2001)]