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Interaction of regular and chaotic states. (English) Zbl 1122.81038
Ann. Phys. 322, No. 10, 2446-2468 (2007).

Summary: Modelling the chaotic states in terms of the Gaussian Orthogonal Ensemble of random matrices (GOE), we investigate the interaction of the GOE with regular bound states. The eigenvalues of the latter may or may not be embedded in the GOE spectrum. We derive a generalized form of the Pastur equation for the average Green's function. We use that equation to study the average and the variance of the shift of the regular states, their spreading width, and the deformation of the GOE spectrum non-perturbatively. We compare our results with various perturbative approaches.

MSC:

81Q50 Quantum chaos
15B52 Random matrices (algebraic aspects)

Keywords:

Chaos; random-matrix theory; doorway state; spreading width

Full Text: [DOI](#)

References:

- [1] Guhr, T.; Müller-Groeling, A.; Weidenmüller, H.A., *Phys. rep.*, 299, 189, (1998)
- [2] Bohr, A.; Mottelson, B., *Nuclear structure*, vol. 1, (1969), Benjamin New York
- [3] Mahaux, C.; Weidenmüller, H.A., *Shell-model approach to nuclear reactions*, (1969), North-Holland Amsterdam
- [4] Feshbach, H., *Theoretical nuclear physics: nuclear reactions*, (1992), Wiley-Interscience New York
- [5] Feshbach, H.; Caracciolo, R.; De Pace, A.; Feshbach, H.; Molinari, A.; De Pace, A.; Feshbach, H.; Molinari, A.; De Pace, A.; Molinari, A., *Phys. rep.*, *Ann. phys. (N.Y.)*, *Ann. phys. (N.Y.)*, *Ann. phys. (N.Y.)*, 296, 263, (2002)
- [6] Molinari, A.; Weidenmüller, H.A.; Molinari, A.; Weidenmüller, H.A., *Phys. lett. B*, *Phys. lett. B*, 637, 48, (2006)
- [7] Efetov, K.B., *Supersymmetry in disorder and chaos*, (1997), Cambridge University Press Cambridge · [Zbl 0990.82501](#)

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