

PERMUTATING QUANTUM EIGENMODES BY USING THE QUASI-ADIABATIC MOTION OF A WALL

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The aim of the work is to study the Schrödinger equation $i\partial_t\psi = -\Delta\psi + V\psi$ on $L^2((0, 1), \mathbb{C})$ when V is a localized potential wall with time-dependent position and intensity. In particular, we show how to control the eigenmodes of the equation with a suitable motion of the potential wall by following the ideas introduced in [?]. The result is achieved by defining a suitable dynamics of V which alternates adiabatic motion with fast accelerations in short time. Such accelerations are required in order to obtain the outcome and to avoid the tunnel effect intensifying when the wall reaches certain positions. In conclusion, we discuss further applications of the proposed techniques such as the validity of the global approximate controllability for such equation.

REFERENCES

- [Tur] D. Turaev, *Exponential energy growth due to slow parameter oscillations in quantum mechanical systems*, Phys. Rev. E 93 (2016), 050203(R).