

Bentosela, F.; Grecchi, Vincenzo

Stark Wannier ladders. (English) Zbl 0743.35053
Commun. Math. Phys. 142, No. 1, 169-192 (1991).

Summary: We study the Schrödinger equation for an electron in a one dimensional crystal submitted to a constant electric field. We prove the existence of ladders of resonances, the imaginary part of which is exponentially small with the field.

MSC:

[35Q40](#) PDEs in connection with quantum mechanics

[35P05](#) General topics in linear spectral theory for PDEs

[81Q05](#) Closed and approximate solutions to the Schrödinger, Dirac, Klein-Gordon and other equations of quantum mechanics

Cited in **9** Documents

Keywords:

Schrödinger equation; electron; one dimensional crystal; ladders of resonances; constant electric field

Full Text: [DOI](#)

References:

- [1] Adler, J., Froese, R.: *Commun. Math. Phys.*100, 161 (1985) · [Zbl 0651.47006](#) · [doi:10.1007/BF01212445](#)
- [2] Bentosela, F., Grecchi, V., Zironi, F.: *J. Phys. C: Solid State Phys.*15, 7119 (1982) · [doi:10.1088/0022-3719/15/35/010](#)
- [3] Berezikovskii, A.M., Ovchinnikov, A.A.: *Sov. Phys. Solid. Stdr.*18, 1908 (1976)
- [4] Briet, P., Combes, J.M., Duclos, P.: *Proceedings of the Holzgau conference on partial differential equations. Teuber Texte zur Mathematik* (1988)
- [5] Buslaev, Dmitrieva: *Bloch electrons in an external electric field (preprint Leningrad 1989)* · [Zbl 0725.34097](#)
- [6] Combes, J.M., Hislop, P.: *Stark ladder resonances for small electric fields (preprint CPT-Marseille 1989)* · [Zbl 0737.34060](#)
- [7] Eastham: *The spectral theory of periodic differential equations.* Edinburgh: Scottish Academic Press 1973 · [Zbl 0287.34016](#)
- [8] Helffer, B., Bjöstrand, J.: *Ann. l'Inst. Henri-Poincaré*,42, 127 (1985)
- [9] Herbst, I., Howland, J.: *Commun. Math. Phys.*80, 23 (1981) · [Zbl 0473.47037](#) · [doi:10.1007/BF01213594](#)
- [10] März, Christoph: *Thesis, Université de Paris Sud, Centre d'Orsay, June 1990*
- [11] Nenciu, A., Nenciu, G.: *J. Phys. A. Math. Gen.*14, 2817 (1981);15, 3313 (1982) Nenciu, G.: *Proceedings of the Poiana-Brasov School* (1989) · [Zbl 0493.47009](#) · [doi:10.1088/0305-4470/14/10/033](#)
- [12] Simon, B.: *Quantum mechanics for Hamiltonians defined as quadratic forms.* Princeton, NJ: Princeton University Press 1971 · [Zbl 0232.47053](#)
- [13] Wannier, G.: *Phys. Rev*117, 432 (1960);181, 1364 (1969) · [Zbl 0091.23502](#) · [doi:10.1103/PhysRev.117.432](#)
- [14] Weinstein, I., Keller, J.: *SIAM J. Appl. Math.*47, 941 (1987) · [Zbl 0652.34033](#) · [doi:10.1137/0147062](#)

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.