

[Sjöstrand, Johannes](#)

Microlocal analysis for the periodic magnetic Schrödinger equation and related questions.
(English) [Zbl 0761.35090](#)

Microlocal analysis and applications, Lect. 2nd Sess. CIME, Montecatini Terme/Italy 1989, Lect. Notes Math. 1495, 237-332 (1991).

[For the entire collection see [Zbl 0747.00025](#).]

This course is devoted to a presentation of the microlocal methods applied to problems in solid state physics. The following material is presented: Floquet theory, stability of the gap for the Schrödinger equation with magnetic field, magnetic matrices, density of states, Harper's equation, de Haas-van Alphen effect.

The interesting fact is the appearance in a lot of different contexts of an effective Hamiltonian which can be considered as a pseudo-differential operator with a small parameter.

These lectures are mainly based on joint work with B. Helffer but contain also original results of the author.

Reviewer: [B.Helffer \(Paris\)](#)

MSC:

- [35Q40](#) PDEs in connection with quantum mechanics
- [35A27](#) Microlocal methods and methods of sheaf theory and homological algebra applied to PDEs
- [81Q20](#) Semiclassical techniques, including WKB and Maslov methods applied to problems in quantum theory
- [35-03](#) History of partial differential equations

Cited in 1 Review
Cited in 26 Documents

Keywords:

[Floquet theory](#); [density of states](#); [Harper's equation](#); [de Haas-van Alphen effect](#)