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Spectral properties of periodic pseudo-differential operators

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Abstract

I will discuss recent results in the spectral theory of self-adjoint periodic elliptic problems. One type of results I will present is proving Bethe–Sommerfeld conjecture (the finiteness of the number of spectral gaps) for a large class of pseudo-differential operators which include, in particular, magnetic Schroedinger operators. The conditions under which the conjecture is shown to hold are very close to optimal ones. The second result is a complete asymptotic expansion for the integrated density of states of a two-dimensional electric Schroedinger operator.

Joint papers with G. Barbatis, R. Shterenberg, and A. Sobolev.