



## Minisymposium 4 - Spectral Theory and Ergodic Operators

### Effective quantum dynamics in perturbed periodic media

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I review results obtained with G. Panati, C. Sparber and H. Spohn concerning the effective dynamics of a single quantum particle in a slowly perturbed periodic potential. They lead to corrections to the effective Hamiltonian obtained from Peierls' substitution and to the so called "semiclassical model of solids". These corrections have a geometrical origin and add to a quantitative understanding of phenomena like Piezoelectricity or the integer quantum Hall effect.