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Localised Wannier functions in metallic systems

The construction of exponentially localised Wannier functions is an useful theoretical and numerical tool to compute properties of crystals modelled by a periodic Schrödinger operator. In the case where the crystal is an insulator (existence of a spectral gap), this construction is well understood, but the case of metallic systems has been much less explored. In this talk, we show that N energy bands of a metal can be exactly represented by N+1 Wannier functions decaying faster than any polynomial. This is joint work with H. Cornean, D. Monaco and A. Levitt