Peierls' substitution for low lying spectral energy windows

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We consider a 2d periodic Schrödinger operator for which we assume that either the first Bloch eigenvalue remains isolated while its corresponding Riesz spectral projection family has a non-zero Chern number, or the first two Bloch eigenvalues have a conical crossing. The system is afterwards perturbed by a weak magnetic field which slowly varies around a positive mean. Then we prove the appearance of a " Landau type " structure of spectral islands and gaps both at the bottom of the spectrum, and near the possible crossings. This is joint (past and ongoing) work with B. Helffer (Nantes) and R. Purice (Bucharest).