June 18 (Wed.) 11:00 – 12:00

On a method of computing Chern numbers and Z_2 invariant on a discretized Brillouin zone

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We present a manifestly gauge-invariant description of Chern numbers on a discretized Brillouin zone. It turns out that it gives strictly integers. We demonstrate that it correctly reproduces exact Chern numbers even on a coarsely discretized Brillouin zone, and that it is very efficient for numerical computations. We apply our method to the calculation of Z_2 invariant for time reversal invariant systems.