Chern number of many-body states on various lattices[1] KOJI
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HATSUGAI, University of Tsukuba — The Chern numbers of many body states
on lattices with magnetic field are numerically evaluated. Various lattice models
are considered with short/long range particle-particle interaction projected into the
Hofstadter type Landau band. The non-Abelian Berry connection defined by an
approximate ground state multiplet is numerically constructed and used for the
computation. For the $\nu = 1/m$ (m:odd) state for the weak field are consistently
described by the Laughlin state with the m fold topological degeneracy indepen-
dent of the lattices. Effects of randomness are included and discussed with spectral
flows as well. We have further discussed systems with strong magnetic field on the
Kagome, square, honeycomb and triangular lattices. Even denominator states on
lattices are also investigated in relation to the possible Fermi liquid state [K. Kudo,
T. Kariyado, and Y. Hatsugai, in preparation].

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