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Bloch Model Wavefunctions and Pseudopotentials for All Fractional Chern Insulators YANG-LE WU, Princeton University, N. REGNAULT, Princeton University, Ecole Normale Superieure and CNRS, B. ANDREI BERNEVIG, Princeton University — We introduce a Bloch-like basis in a C-component lowest Landau level fractional quantum Hall effect (FQH), which entangles the real and internal degrees of freedom and preserves an $N_x \times N_y$ full lattice translational symmetry. We implement the Haldane pseudopotential Hamiltonians in this new basis. Their ground states are the model FQH wavefunctions, and our Bloch basis allows for a mutatis mutandis transcription of these model wave functions to the fractional Chern insulator (FCI) of arbitrary Chern number C, obtaining wavefunctions different from all previous proposals. For $C > 1$, our wavefunctions are related to color-dependent magnetic-flux inserted versions of Halperin and non-Abelian color-singlet states. We then provide large-size numerical results for both the $C = 1$ and $C = 3$ cases. This new approach leads to improved overlaps compared to previous proposals. We also discuss the adiabatic continuation from the FCI to the FQH in our Bloch basis, both from the energy and the entanglement spectrum perspectives.

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