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Mapping a fractional quantum Hall state to a fractional Chern insulator YINHAN ZHANG, JUNREN SHI, Peking University — We establish a variational principle for properly mapping a fractional quantum Hall (FQH) state to a fractional Chern insulator (FCI). We find that the mapping has a gauge freedom which could generate a class of FCI ground state wave functions appropriate for different forms of interactions. Therefore, the gauge should be fixed by a variational principle that minimizes the interaction energy of the FCI model. For a soft and isotropic electron-electron interaction, the principle leads to a gauge coinciding with that for maximally localized two-dimensional projected Wannier functions of a Landau level.

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