

Abstract Submitted
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Flat Chern Bands and Edge States in the Hofstadter Model Near to Rational Flux FENNER HARPER, STEVEN SIMON, University of Oxford, RAHUL ROY, University of California, Los Angeles — We present a perturbative approach to the study of the Hofstadter model for when the amount of flux per plaquette is close to a rational fraction [Phys. Rev. B **90**, 075104 (2014)]. Within this approximation, the eigenstates of the system connect smoothly to the Landau levels of the continuum, but in general develop an additional species (or colour) degree of freedom. Using the formalism of Haldane pseudopotentials, we describe the fractional quantum Hall-like wavefunctions that arise when interactions are turned on. We also discuss the form and energy spectrum of the bosonic edge excitations that would occur in the presence of a confining harmonic trap, making connections to the recent experimental realisations of the Hofstadter model using ultracold atoms.

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