Abstract Submitted for the MAR14 Meeting of The American Physical Society

Analyzing pseudo potentials in "guiding-center-only" approach¹ ALEXANDER SEIDEL, ZOHAR NUSSINOV, Department of Physics, Washington University in St. Louis, JORGE DUKELSKY, Instituto de Estructura de la Materia, Madrid, Spain, GERARDO ORTIZ, Department of Physics, Indiana University, Bloomington — A variety of short-range interactions are known whose zero energy modes successfully describe the low energy properties of various interesting phases in the fractional quantum Hall regime. The theoretical analysis of Haldane-type pseudo potentials and their generalizations is usually based on a first quantized picture, deriving nice analytical properties of their first quantized zero mode wave functions, which have polynomial form in most standard geometries. Recently, however, the second quantized -or guiding center- form of these pseudo-potentials has enjoyed much interest, e.g., in flat band solids. In such a context, the embedding of the problem into the lowest Landau level of some larger Hilbert space is artificial, and with the construction of new models in mind, it seems beneficial to understand how to systematically "solve" known pseudo-potential problems in a purely second quantized picture. He we discuss some general theorems that apply to the second quantized forms of pseudo-potential Hamiltonians, and allow for the derivation of many known properties of zero modes, in particular "squeezing", in a second quantized language, starting from a second quantized Hamiltonian. [1] Phys. Rev. B 88, 165303(2013)

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