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Quasiparticles and excitons for the Pfaffian quantum Hall state ANTOINE STERDYNIAK, Ecole Normale Superieure Paris, IVAN RODRIGUEZ, National University of Ireland, Maynooth, Ireland, MARIA HERMANNS, Princeton University, JOOST SLINGERLAND, National University of Ireland, Maynooth, Ireland, NICOLAS REGNAULT, Ecole Normale Superieure Paris, CNRS — We propose trial wave functions for quasiparticle and exciton excitations of the Moore-Read Pfaffian fractional quantum Hall states, both for bosons and for fermions, and study these numerically. Our construction of trial wave functions employs a picture of the bosonic Moore-Read state as a symmetrized double layer composite fermion state. We obtain the number of independent angular momentum multiplets of quasiparticle and exciton trial states for systems of up to 20 electrons. We find that the counting for quasielectrons at large angular momentum on the sphere matches that expected from the CFT which describes the Moore-Read state's boundary theory. In particular, the counting for quasielectrons is the same as for quasiholes, in accordance with the idea that the CFT describing both sides of the FQH plateau should be the same. We also show that our trial wave functions have good overlaps with exact wave functions obtained using various interactions, including second Landau level Coulomb interactions and the 3-body delta interaction for which the Pfaffian states and their quasiholes are exact ground states.

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