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Rotational properties of two-component Bose gases in the lowest Landau level[1] MARIUS MEYER, Univ of Oslo, GANESH JAYA SREEJITH, PCS Max Planck Institute, SUSANNE VIEFERS, Univ of Oslo — We study the rotational (yrast) spectra of dilute two-component atomic Bose gases in the low angular momentum regime, assuming equal interspecies and intraspecies interaction. Our analysis employs the composite fermion (CF) approach including a pseudospin degree of freedom. While the CF approach is not *a priori* expected to work well in this angular momentum regime, we show that composite fermion diagonalization gives remarkably accurate approximations to low energy states in the spectra. For angular momenta $0 < L < M$ (where N and M denote the numbers of particles of the two species, and $M \geq N$), we find that the CF states span the full Hilbert space and provide a convenient set of basis states which, by construction, are eigenstates of the symmetries of the Hamiltonian. Within this CF basis, we identify a subset of the basis states with the lowest Λ-level kinetic energy. Diagonalization within this significally smaller subspace constitutes a major computational simplification and provides very close approximations to ground states and a number of low-lying states within each pseudospin and angular momentum channel.

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