Parafermionic states in rotating Bose-Einstein condensates NICO-
LAS REGNAULT, LPA, ENS-Paris, France, THIERRY JOLICOEUR, LPTMS, Or-
say, France — Rotating Bose-Einstein condensates in a trap are the place of a very
rich physics. It has been predicted that, under appropriate conditions, they will
behave like two dimensional electron systems in the fractional quantum Hall effect
regime. In addition to the usual fractions, more exotic phases have also been pre-
dicted at filling factor $\nu = k/2$. These parafermionic states are described by the
Read-Rezayi (RR) wave functions. We study how the system size and interaction
act on the overlap between the true ground state and corresponding RR state. The
quasihole excitations of the RR states are known to obey non-Abelian statistics.
We numerically evaluate the degeneracy of these states and show it is in agreement
with a formula given by E. Ardonne. We compute overlap between low-energy true
eigenstates and quasihole ground states, and discuss in which cases such description
is valid.

Nicolas Regnault
LPA, ENS-Paris

Date submitted: 30 Nov 2005   Electronic form version 1.4