Non-Abelian Anyon Superconductivity

WAHEB BISHARA, Caltech, CHETAN NAYAK, Microsoft Station Q and UCLA — Non-Abelian Anyons are proposed to exist in certain spin models and in Quantum Hall systems at certain filling fractions. In this work we studied the ground state of dynamical $SU(2)$ level $\kappa$ Chern Simons non-abelian anyons at finite density and no external magnetic field. We find that in the large $\kappa$ limit the topological interaction induces a pairing instability and the ground state is a superconductor with $d + id$ gap symmetry. We also develop a picture of pairing for the special value $\kappa = 2$ and argue that the ground state is a superfluid of pairs for all values of $\kappa$. 

Waheb Bishara
Caltech

Date submitted: 19 Nov 2006