Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Quantum phase transitions of polar molecules in bilayer systems[1]
DAW-WEI WANG, National Tsing-Hua University — We investigate the quantum phase transitions of bosonic polar molecules in a two-dimensional double layer system. We show that an interlayer bound state of dipoles (dimers) can be formed when the dipole strength is above a critical value, leading to a zero energy resonance in the interlayer s-wave scattering channel. In the positive detuning side of the resonance, the strong *repulsive* interlayer pseudo-potential can drive the system into a maximally entangled state, where the wavefunction is a superposition of two states that have all molecules in one of the two layers and none in the other. We critically discuss how the zero-energy resonance, dimer states and the maximally entangled state can be measured in time-of-flight experiments.

[1]Daw-Wei Wang, cond-mat/0611394

Daw-Wei Wang
National Tsing-Hua University

Date submitted: 15 Nov 2006 Electronic form version 1.4