

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Natural orbits of atomic Cooper pairs in a nonuniform Fermi gas Y.H. PONG, C.K. LAW, Department of Physics and Institute of Theoretical Physics, The Chinese University of Hong Kong, Shatin, Hong Kong SAR, China — We present the natural orbits of atomic Cooper pairs in an inhomogeneous Fermi gas. These orbits provide the pairing mode functions of constructing BCS states in finite systems. We further exploit such orbits to study Cooper pair wave functions in various trapping situations. In particular, we quantify and characterize the quantum entanglement between atoms in a Cooper pair associated with the spatial degrees of freedom.

(Reference : Y.H. Pong, C.K. Law, *Phy. Rev. A* **74**, 013618 (2006))

Y. H. Pong
Department of Physics and Institute of Theoretical Physics
The Chinese University of Hong Kong, Shatin, Hong Kong SAR, China

Date submitted: 16 Nov 2006

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