乞掲示

# 理化学研究所原子核グループコロキウム　*2003. 2. 18*

**講師 ： Dr. Nguyen Dinh Dang**

( RIKEN )

**題目 ：** Modified Hartree-Fock-Bogoliubov theory

∗ The seminar will be given in *English.*

**日時 ：** 2003年 2月 18日 (Tue.)　14:00 –

**場所 ：** RIKEN Main Bldg. 2F Seminar Room


## *Abstract*

The modified HFB (MHFB) theory at finite temperature is derived, which exactly conserves the unitarity relation of the particle density matrix. This is achieved by constructing a quasiparticle density matrix, where the fluctuation of the quasiparticle number is microscopically built in. This matrix can be directly obtained from the zero-temperature quasiparticle density matrix by applying the secondary Bogoliubov, which includes the quasiparticle occupation number. It is shown that, in its limit of constant pairing parameter, the MHFB theory yields the modified BCS (MBCS) equations, which have been obtained previously by Dinh Dang and Zelevinsky. It is also proved that the modified quasiparticle RPA, which obtained by using the MBCS quasiparticle excitations, conserves exactly the Ikeda sum rule. The numerical calculations of the pairing gap, heat capacity, level density, and level density parameter within the MBCS theory are carried out for $^{120}$Sn. The results show that the superfluid - normal phase transition is completely washed out. The applicability of the MBCS up to a temperature as high as $T \sim 5$ MeV is analyzed in detail. The application of the MBCS theory to nuclei far from stability is also discussed.


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