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**Magnetic properties and pseudogap phenomenon in an ultracold Fermi gas with population imbalance** TAKASHI KASHIMURA, RYOTA WATANABE, YOJI OHASHI, Department of Physics, Keio University — We discuss the magnetic properties of an ultracold Fermi gas with population imbalance. In the unpolarized case, the photoemission spectroscopy have observed a gap-like (pseudogap) structure in the normal state above the superfluid phase transition temperature, such an anomalous structure has not been detected in the highly-polarized regime. In this talk, we discuss how the pseudogap phenomenon is affected by the polarization of the system. Within the framework of an extended  $T$ -matrix theory, we calculate the polarization dependence of DOS to show that the pseudogap gradually disappears with increasing the polarization rate. In a highly-polarized regime, the system is simply described as a gas of long-lived quasiparticles. We also show that the calculated polarization as a function of an effective “magnetic” field  $h = (\mu_{\uparrow} - \mu_{\downarrow})/2$  agrees well with the experimental data [where  $\mu_{\sigma}$  is the chemical potential of atoms with pseudospin  $\sigma(=\uparrow, \downarrow)$ ].

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