The Behavior of the Staggered Magnetization in Weak Antiferromagnetic Metals

N. Hatayama, R. Konno, Y. Takahashi

Kinki University Technical College, Nabari-shi 518-0459, Japan

a University of Hyogo, Ako 678-1297, Japan

e-mail address: hatayama@ktc.ac.jp

Effects of spin fluctuations on the staggered magnetization in itinerant weak antiferromagnets is investigated below the Neel temperature $T_N$.

The magnetization of itinerant ferromagnets is known to vanish discontinuously at the critical temperature in the rotationally invariant treatment of the self-consistent renormalization spin fluctuation theory. The difficulty is resolved for ferromagnets by taking account of the effects of spin-wave excitations into the transverse component of the dynamical magnetic susceptibility [1]. The purpose of this study is to extend the idea to the case of itinerant antiferromagnets. We have then succeeded in deriving the temperature dependence of the spontaneous staggered magnetization below $T_N$ that can be compared with experiments quantitatively. Some numerical results are also shown near the ground state and the Neel temperature $T_N$.