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**Magnetic property of quark matter in inhomogeneous chiral phase** RYO YOSHIIKE, KAZUYA NISHIYAMA, TOSHITAKA TATSUMI, Department of Physics, Kyoto University — Recently, a new phase where chiral symmetry is broken with the periodically modulating chiral condensate is found in mean field approximation of the NJL model [1]. Here we consider formation of static dual scalar and pseudoscalar density wave condensates on the chiral circle called “dual chiral density wave (DCDW).” By the analysis of the thermodynamic potential, it has been found that the DCDW phase is more favored in an external magnetic field [2]. We study the response of quark matter to a weak external magnetic field to show the spontaneous magnetization in the DCDW phase. In an external magnetic field, the energy spectrum of the lowest Landau level becomes asymmetric about zero and chiral anomaly manifests through [3]. This spectral asymmetry contributes to the thermodynamic potential by the term proportional to a magnetic field, which is the origin of the spontaneous magnetization in the DCDW phase. We also discuss the magnetic transition around the Lifshitz point by examining the magnetic susceptibility.

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