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Magnetic torque measurements in a chiral magnet $CrNb_3S_6$ JUNICHIRO YONEMURA, Osaka Prefecture Univ, TAKANORI KIDA, DAICHI YOSHIZAWA, Osaka Univ, YUSUKE KOUSAKA, JUN AKIMITSU, SADAFUMI NISHIHARA, KATSUA INOUE, Hiroshima Univ, JUNICHIRO KISHINE, The Open Univ of Japan, MASAYUKI HAGIWARA, Osaka Univ, YOSHIHIKO TOGAWA, Osaka Prefecture Univ — Chiral magnetic orders emerge in a particular class of magnetic materials with a chiral crystal structure. As a consequence of the competition between Heisenberg exchange and Dyzaloshinskii-Moriya (DM) interactions in the presence of external magnetic field, chiral helimagnetic order (CHM) formed at zero magnetic field transforms into a nonlinear magnetic superlattice called chiral soliton lattice (CSL) under magnetic fields perpendicular to the chiral axis. The CSL consists of forced ferromagnetic (FM) regions periodically partitioned by chiral soliton kinks of spins. The period of the CSL increases gradually with increasing magnetic field. The CSL is the ground state and exhibits a phase transition into forced FM state above the critical field. To understand the nature of the phase transition, it is important to examine thermodynamic quantities such as magnetization. Furthermore, it is interesting to explore the possibility of the discretization of such physical quantities in a finite CSL system. In this talk, we will present the development of magnetic torque measurement method using micro cantilever in order to precisely measure the magnetization of a micro-sized sample and a set of experimental data obtained by magnetic torque measurements performed in chiral magnet $CrNb_3S_6$. Hysteresis and stepped behavior of magnetization observed are discussed.

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