Hysteretic Successive Field-Induced CDW phases in HMTSF-TCNQ

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This material, is a TTF-TCNQ analogue, i.e. 2-chain Q1D conductor, undergoes CDW transition at 30 K at p = 0. The CDW is suppressed around 1 GPa. We found that it exhibits field-induced successive transitions around 1 GPa, which is hysteretic as shown in Fig 1 [1]. This behavior is observed neither at p = 0 nor at 2 GPa. This behavior is reminiscent of the FISDW in TMTSF₂-X salts. Since the ground state of this material at p = 0 is CDW, we speculate this behavior is of FICDW.

What is different phenomenologically is that this behavior is seen not only one field direction, but also in any directions at least perpendicular to the 1D axis. The angular dependence of magnetoresistance was examined as shown in Fig. 2. A tentative interpretation is that there must be 2D and 3D Fermi surface pockets which are contributing this possible field-induced CDW (FICDW).