## Layer and Molecular Orientation in Electroclinic Liquid Crystals: Dynamic µ-Diffraction

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For the direct determination of the microscopic local layer structure in the smectic liquid crystal under the external field, time-resolved synchrotron X-ray  $\mu$ -diffraction has become a powerful tool [1]. In this presentation, static and dynamic local layer structures and local molecular orientation in the electroclinic effect of the chiral smectic A (SmA) phase were analyzed with  $\mu$ -diffraction.

An X-ray beam size was about 3 x 4  $\mu$ m<sup>2</sup>. The samples were ferroelectric liquid crystals (TK-C101) and measured in the SmA phase. At the high electric field, the compound chevron structure, consisting of the curved vertical chevron and the horizontal chevron, was realized. The molecular orientation measured by the high angle halo-pattern showed the spatially-alternate molecular inclination corresponding to the layer deflection. It was shown that the anchoring effect at the alignment film played an important role for the layer structure. The layer response of the electroclinic effect was similar to that in the high electric field treatment of SmC phase, though the origin of the layer shrinkage was different between them.

[1] a) Takahashi Y., et al, Jpn. J. Appl. Phys., 2001, 40, 3294; b) Phys. Rev. 2003, E67, 051706.

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