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Transient Splitting of Conoscopic Isogyres of a Uniaxial Nematic[1] YOUNG-KI KIM, BOHDAN SENUK, LUANA TORTORA, Liquid Crystal Institute and Chemical Physics Interdisciplinary Program, Kent State University, Kent, OH, USA, SAMUEL SPRUNT, Physics Department, Kent State University, Kent, OH, USA, MATTHIAS LEHMANN, Institute of Chemistry, Chemnitz University of Technology, Chemnitz, Germany, OLEG D. LAVRENTOVICH, Liquid Crystal Institute and Chemical Physics Interdisciplinary Program, Kent State University, Kent, OH, USA — The phase identification is often based on conoscopic observations of homeotropic cells: A uniaxial nematic produces a pattern with crossed isogyres, while the biaxial nematic shows a split of isogyres. We demonstrate that the splitting of isogyres occurs even when the material remains in the uniaxial nematic phase. In particular, in the bent core material J35, splitting of isogyres is caused by change of the temperature. The effect is transient and the isogyres return to a uniaxial (crossed) configuration after a certain time that depends on sample thickness, temperature, and rate of temperature change; the time varies from a few seconds to tens of hours. The transient splitting is caused by the temperature-induced material flow that triggers a (uniaxial) director tilt in the cell. The flows and the director tilt are demonstrated by the CARS microscopy and fluorescent confocal polarizing microscopy (FCPM). This transient effect is general and can be observed even in E7 and 5CB. The effect should be considered in textural identifications of potential biaxial nematic materials.

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