

Frontiers in European Research on Liquid Crystalline Soft Matter

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Session v. *Liquid crystals in sensors, actuators and novel optic and electrooptic devices*



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Electro-optic effects in reduced symmetry liquid crystals

The electro-optic properties of liquid crystals are at the heart of the displays industry, and everyone in the field is well aware of the desire to switch faster, with lower energy costs. This talk considers two distinct liquid crystalline systems, both with reduced symmetry; firstly the ferroelectric and antiferroelectric phases (also known as the intermediate phases), and secondly thermotropic biaxial liquid crystals. We describe some novel electro-optic effects observed in the intermediate phases, including field-induced phase transitions and asymmetric switching,. Techniques including resonant x-ray scattering and time-resolved x-ray scattering have been used to fully characterise the switching phenomena. The second part of the talk considers a biaxial nematic system. The controversy around the existence of biaxial nematic phases remains, but we have reported clear evidence of biaxial order in a bent-core material, and show marked differences in the electro-optic properties in the uniaxial and biaxial nematic regimes of this material. The results are discussed in the context of the potential for displays.

References

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