How to induce high sensitivity of liquid crystal to external magnetic field?

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Liquid crystals (LC) are very sensitive to application of an external electric field due to the large value of dielectric anisotropy while are practically insensitive to application of magnetic field. The way how to improve sensitivity of currently used LC to magnetic field is to dope them with magnetic nanoparticles. The solution is the production of so called ferronematics, ferrocholesterics, ferrosmectics etc. i.e. stable colloidal suspension of LC with small volume concentrations of magnetic nanoparticles. In the presentation will be illustrated many examples of the influence of magnetic field as well combination of magnetic and electric field on the structural transitions let say Freedericksz transition in ferromematics wirh various LC i.e. calamitic liquid crystals, banana-shaped, lyothropic as well as biological LC. The low magnetic field response in studied samples will be presented as well as the effect of magnetic particles and magnetic field on the phase transition as nematic-isotropic transition.

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