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### Molecular Crystals and Liquid Crystals

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### Surface-Mediated Beam Coupling in Nominally Pure Nematic Liquid Crystal

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#### Abstract:

We have carried out experiments that indicate a surface-charge-mediated photorefractive effect in nominally pure liquid crystal homeotropically aligned on ITO-electrodes. We suggest that interfering beams modulate distribution of the charges in a layer of LC molecules adsorbed by the ITO-electrodes surfaces. It results in a tangential component of dc-field applied to the cell which re-arranges liquid crystal molecules in the adsorbed layer. This re-arrangement causes an easy axis modulation and the grating recording. A bulk-mediated mechanism related to an instability induced by the dc-field may give a contribution to the grating formation in specific range of the recording parameters.

#### Keywords:

nematic liquid crystal, photorefraction, photo-charges

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