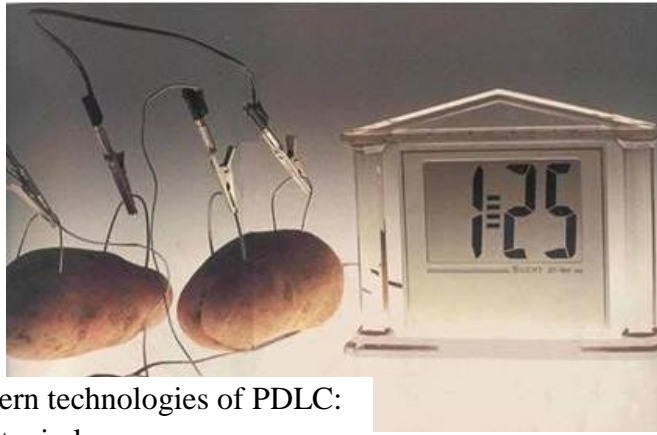


Research (What is it about?)	Highly transparent polymer-dispersed liquid crystals over a wide range of viewing angles
UNN authors	<i>Mashin A.</i>
We find (The result)	It is shown that using <i>tilted elongated</i> liquid crystals <i>droplets</i> in polymer film allows one to reduce the inherent haze effect and obtain highly transparent films over a wide range of viewing angles
Abstract	<p>Liquid crystals (LC) are the basis for all modern displays i.e. screens with electrically driven transparency. To achieve this effect, one should place an LC into some matrix. The widest practical possibilities, especially for big surfaces (light shutters, displays, rear mirrors), are the LC droplets in polymer film. Such systems are named polymer-dispersed liquid crystals (<i>PDLC</i>). They combine the convenient properties of polymer matrix (including elasticity) with the electro-optical properties of LC. However, the perfect light transmission occurs only when the light incidence direction is the same as that of the electric field and the transmittance drops very quickly for angles larger than 30°. This effect, called <i>haze</i>, greatly limits the applications of PDLCs.</p> <p>We propose a method for achieving highly transparent PDLC devices over a wide range of viewing angles. The method is based on the use of PDLCs with tilted elongated LC droplets and driven by opportune electric fields. As a result light <i>transmission</i>, which is practically <i>constant</i> for viewing angle ranging <i>from 0° to 60°</i>, has been achieved.</p>

Representative articles 2017-2018, quartiles	1. <i>De Filpo G., Mashin A. I., Beneduci A., Chidichimo G. Reduced OFF-axis haze in polymer-dispersed liquid crystals. Liquid Crystals. 44(9), 1477-1483 (2017).</i>	Q2, Q2, Q2
Q-index (Qi) for the result		3
high orange		

In collaboration	University of Calabria, Rende, Italy
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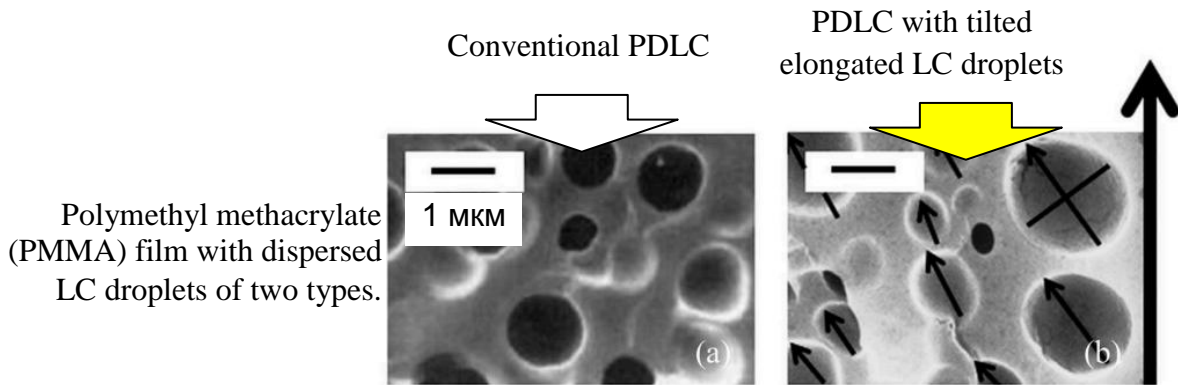
One of the first LC displays. The galvanic cell on two potatoes with Zn and Cu wires is sufficient for its functioning.



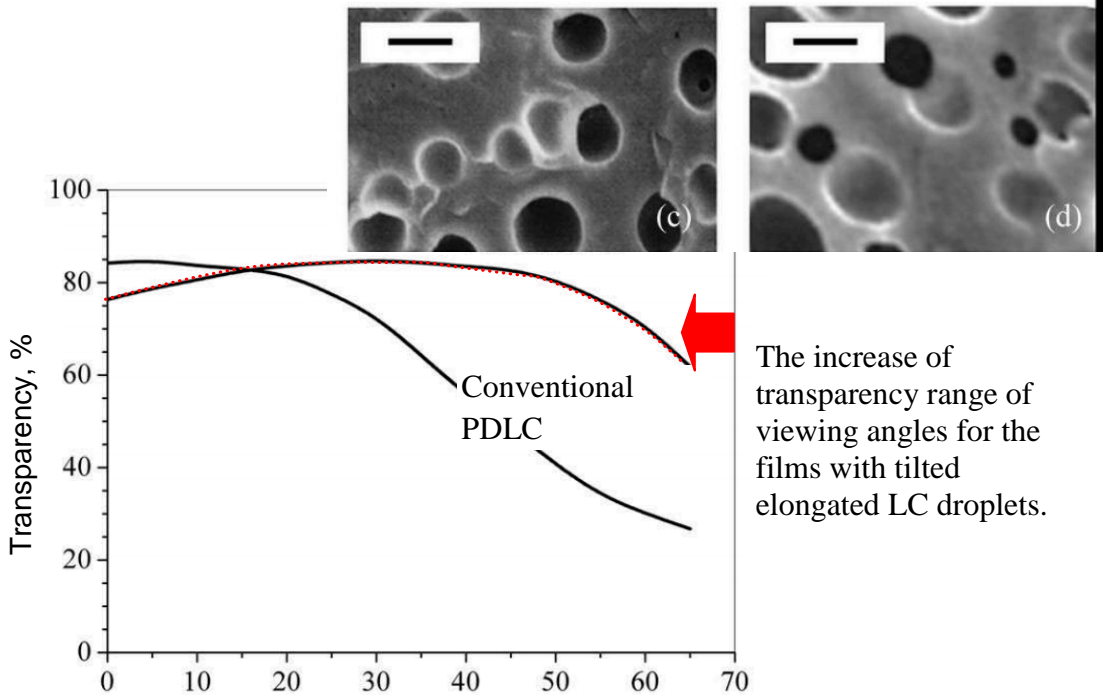
Modern technologies of PDLC: smart windows.



The first Samsung announced smartphone with flexible PDLC display.



The small arrows show the droplet orientation, the big ones indicate the normal to surface direction.



The increase of transparency range of viewing angles for the films with tilted elongated LC droplets.