Liquid Crystal TV and OLED TV: issues and opportunities

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There are currently two competing technologies on the TV market: liquid crystal TV and OLED TV. Each of them has its strengths and weaknesses, but at the same time, both technologies also see rapid developments that further improve their quality. In an OLED matrix the pixels are driven by a DC current and emit light proportional to the level of the current. In an LCD matrix the pixels are driven by an AC voltage and the polarization of incident light is modified, which, in combination with a polarizer determines the transmission. In both the OLED and the LCD TV red, green and blue color filters are used to render millions of colors by mixing filtered white light.

In this presentation we will discuss differences between the two technologies, and address a number of important advances in the field of OLEDs (multilayer stacks, temperature dependency, quantum dot OLEDs) and LCDs (LEDarray illumination, photoluminescent quantum dots, brightness enhancement films, local dimming). In addition a few contribution of the research group will be highlighted [1-4].

[1] F. Chesterman et al., Journal of Display Technology **12**, 1673 (2016)
[2] F. Chesterman et al., Journal of Display Technology **12**, 1268 (2016)
[3] M. Mohammadimasoudi, APL Materials **5**, 076104 (2017)
[4] Y. Ussembayev et al., ACS Photonics, DOI: 10.1021/acsphotonics.8b01405 (2019)