Dual-view blue phase liquid crystal display designed by Patterned Electrodes

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Blue phase (BP) liquid crystal display (LCD) has sub-millisecond response time, high contrast ratio (CR), and wide viewing angle, suggesting that BP LCD has a potential to become a next-generation display technology [1-2]. Recent developments of display has not only been limited to improve image quality but has also focused on extending the display function, such as viewing angle controllable display [3] and dual-view (DV) display[4]. To date, few approaches have been proposed for the fabrication of DV LCDs, but the low CR (less than 100 in the intended viewing direction) and light leakage problems of the DV LCD are still remain unsolved [4-6].

In this presentation, we propose a DV LCD using BP material. The viewing direction of the DV BP LCD is controlled by the inclined electric field provided by the patterned electrodes, as show in Fig. 1. The demonstrated DV BP LCD has a high CR (higher than 1000 in the intended viewing direction), as shown in Fig. 2. The operation mechanism, electrooptical properties are explained in the presentation.

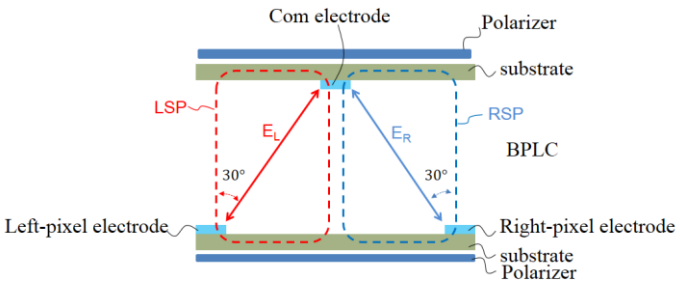

Fig. 1: Electrode structure of the DV BP LCD.

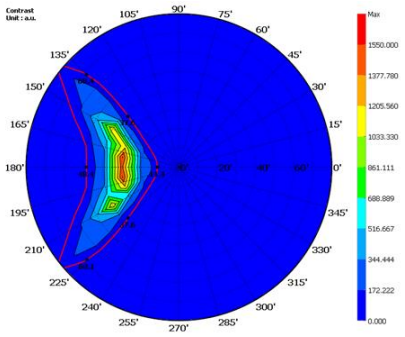

Fig. 2: CR of the DV BP LCD.

Acknowledgment

This study was supported financially by the National Science Council of the Republic of China, Taiwan (Contract Nos. NSC 101-2112-M-018-002-MY3 and NSC 101-2811-M-018-014).

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