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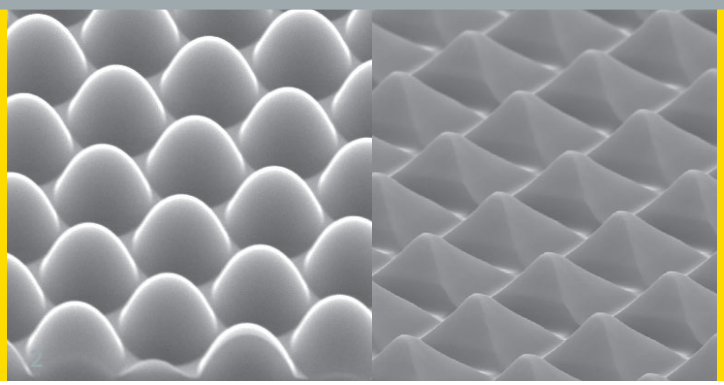

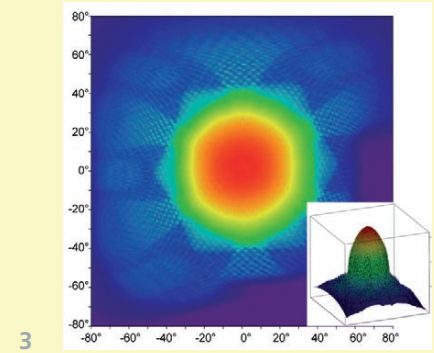

1 *White OLED (Merck); upper half with outcoupling micro-lens array.*
2 *Examples of micro optical structures, fabricated at IOF.*
3 *Maximum forward emitting OLED utilizing the micro optical approach.*

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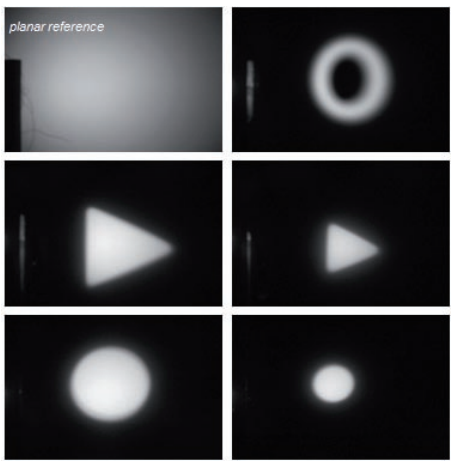
TAILORING THE LIGHT EMISSION PATTERN OF ORGANIC LEDS

Micro Optics for Organic LED

Organic LEDs (OLEDs) usually exhibit a more or less Lambertian far-field emission pattern. Depending on the desired application, approaches to tailor this characteristics efficiently are required.



Various emission patterns of a white OLED generated by means of micro-optical arrays

Approach

The combination of a primary optics for enhanced light outcoupling from the substrate glass (see Figs. 1 and 2) and a secondary beam-shaping optics allows to generate user-defined far-field emission patterns. The high reflectivity of the OLED's active thin film stack enables the so-called photon recycling, yielding a significant brightness enhancement in e.g. perpendicular direction (Fig. 3).
For this purpose, micro-optical array systems are simulated and designed, optionally adapted to the specific OLED stack, and laboratory samples as well as replication master structures are offered.

Reference

M. Flämmich, D. Michaelis et al.
Proc. SPIE 7716, 771616 (2010)