Fraunhofer IOF

Fraunhofer Institute for Applied Optics and Precision Engineering IOF

Lightfield displays

Multilayer microoptics displaying 3D motifs

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Cover: Lighfield display showing the »starburst« motif.

Top: Lighfield display showing the »piercing stick« and »double-sphere« motifs.

Description

Together with artists Dachroth + Jeschonnek from Berlin, Fraunhofer IOF developed multi-aperture lightfield displays. Different artistic motifs like spheres and sticks of light are shown which appear to move with the movement of the observer giving a 3D appearance of a 2D object.

The lightfield display consists of a 3-wafer stack of a microlens array (MLA) with buried mask for stray light suppression, followed by a system aperture array and an object mask array (OMA). The OMA is generated by automated backward ray-tracing of the real and virtual projected motifs through the individual channels of the MLA.

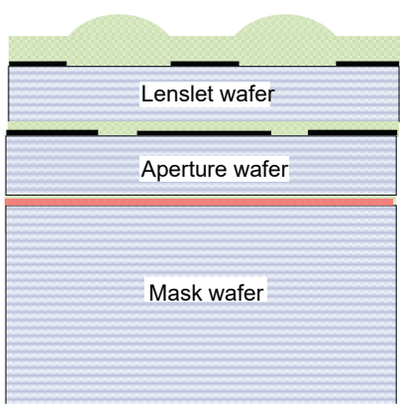
Lenslets are mastered by reflow and replicated as polymer-on-glass elements. All three wafers are assembled in a mask aligner.

Specifications

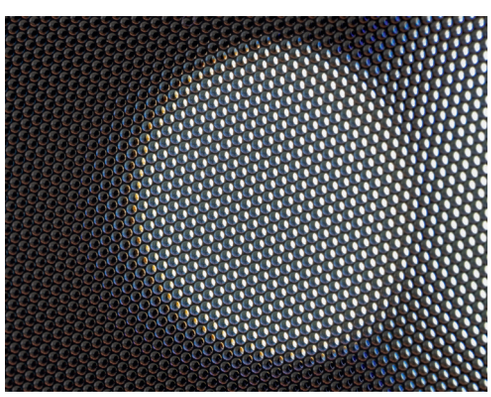
- FOV : ±20° … ± 40°
- Display diameter: 190 mm
- Display thickness: ca. 2.5 mm
- Lenslet apertures: ø 300 µm… ø 500 µm

Applications

- 3D display for branding / logos
- Touchless user interfaces
- Automotive rearlight / tailgate clusters



Schematic of lightfield display.



Close up view of the MLA.

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