

Efficient high quality light management

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Muttenz, 12.12.2016

CSEM at a glance

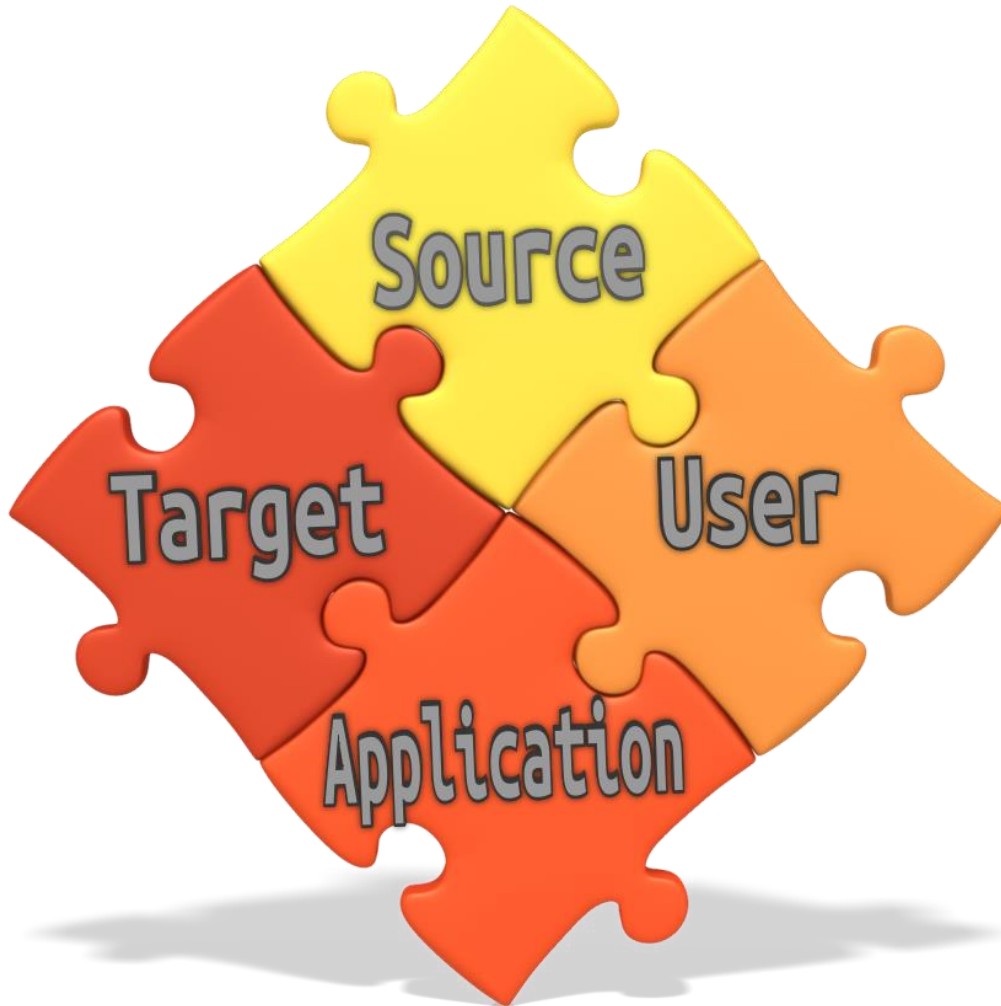
Our mission

Development and transfer of microtechnologies to the industrial sector – in Switzerland, as a priority – in order to reinforce its competitive advantage

- Cooperation agreements with established companies
- Creation of start-ups



Lighting

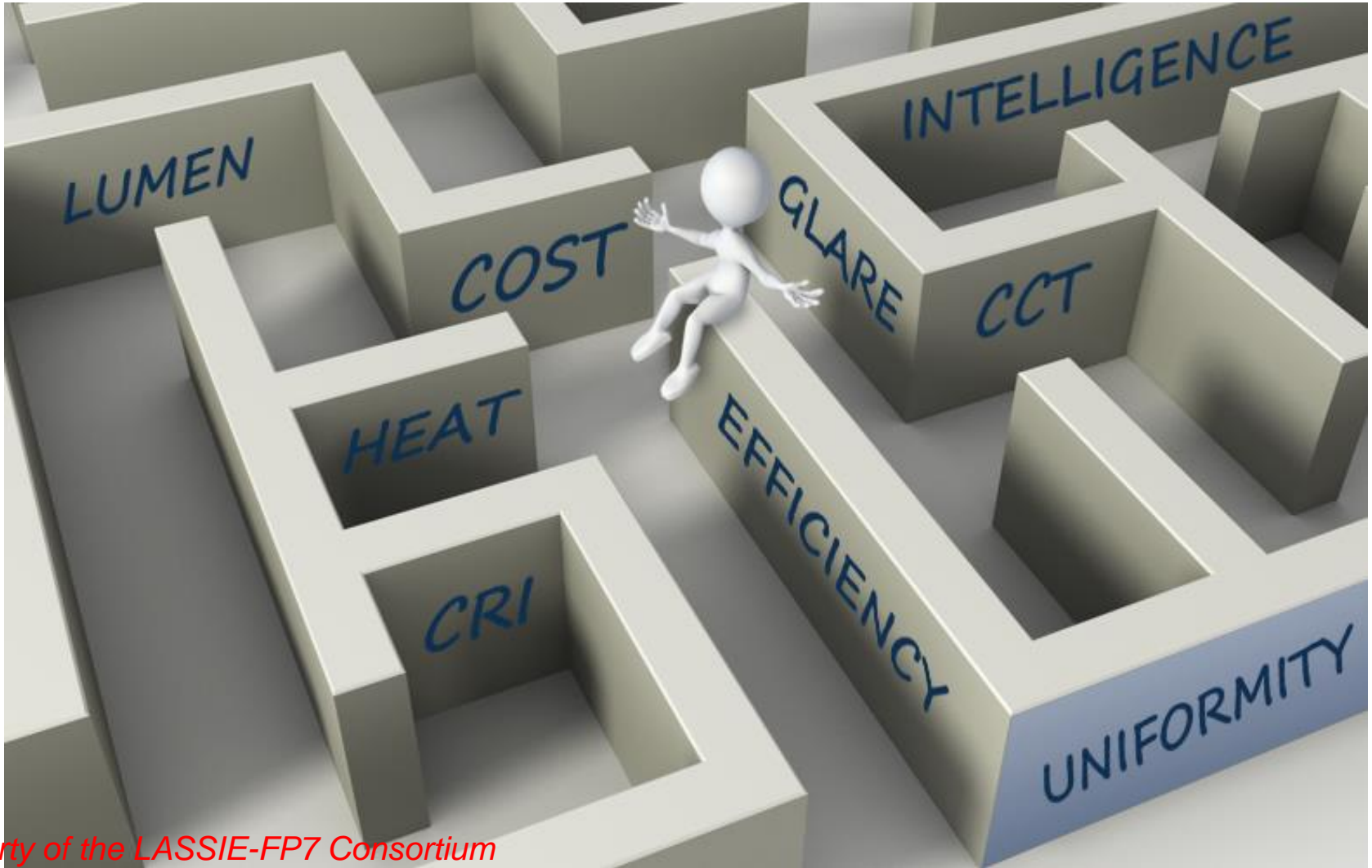


Lighting

The deliberate use of natural or artificial light to achieve a practical or aesthetic effect

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Lighting



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Artificial light sources

Incandescent



Halogen



Fluorescent



LED

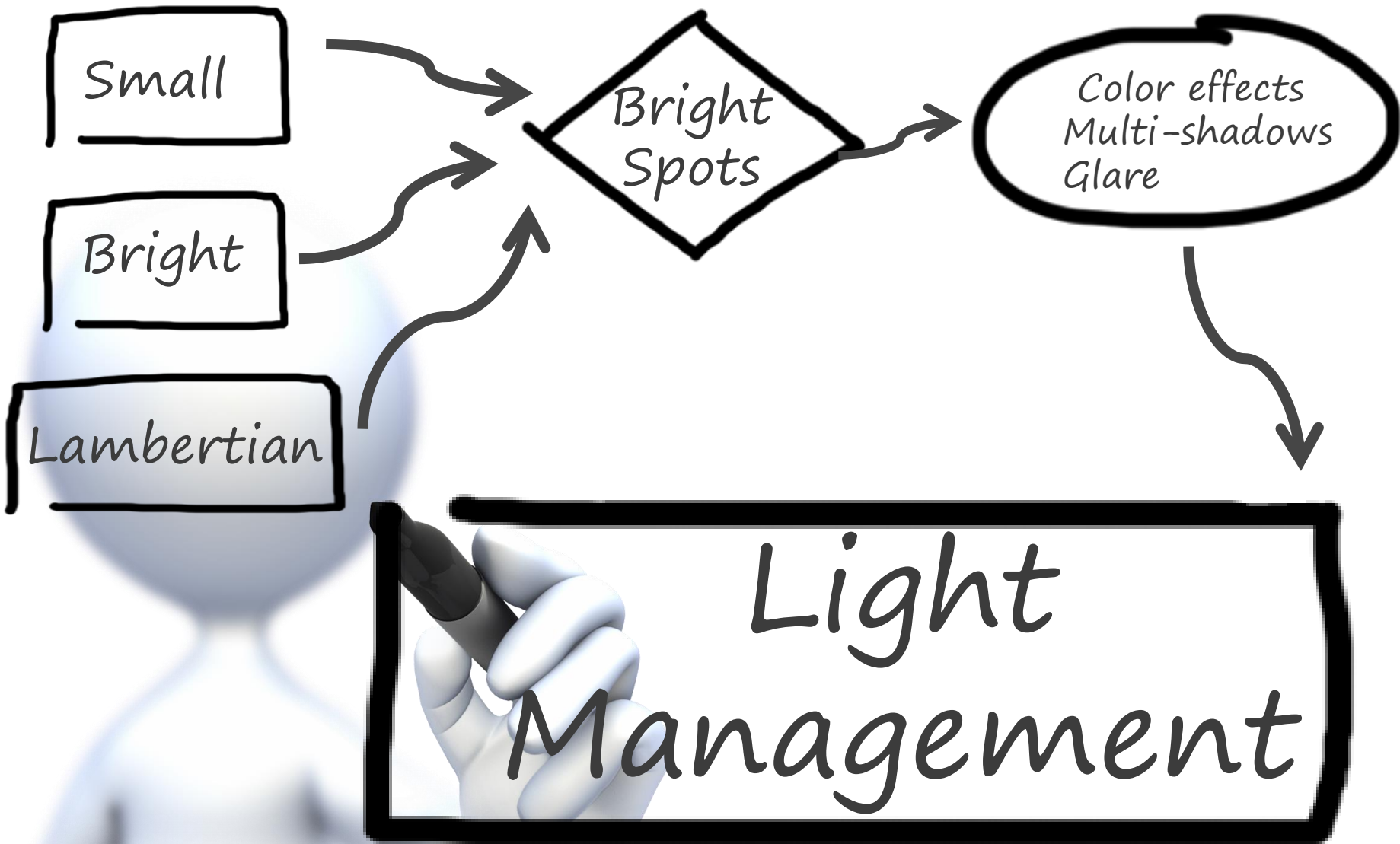


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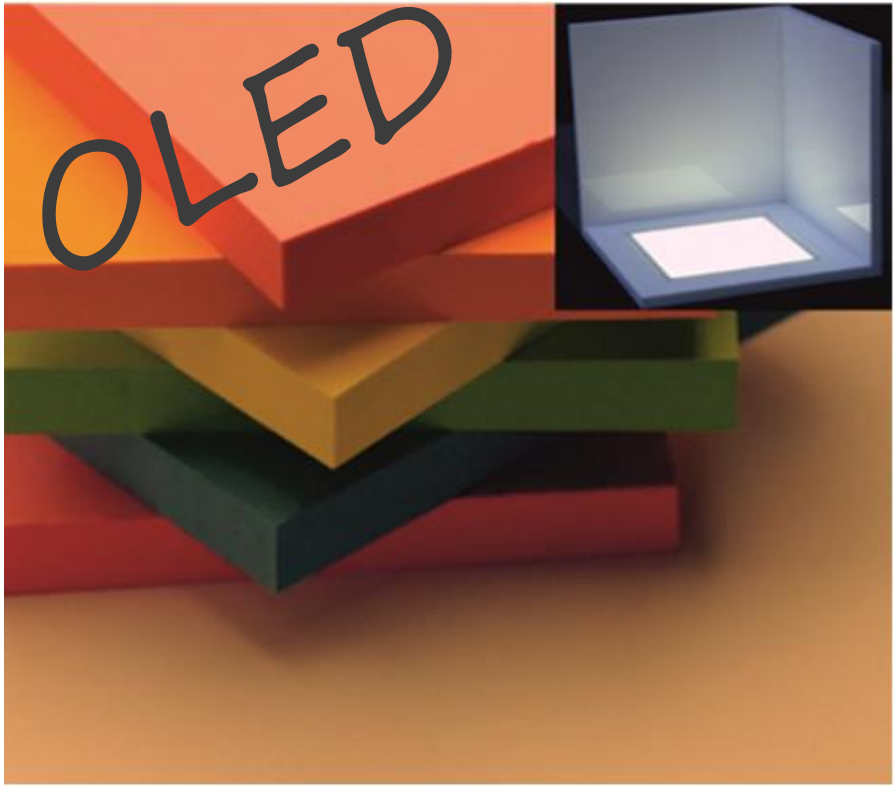
Why LED technology?



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Light Management

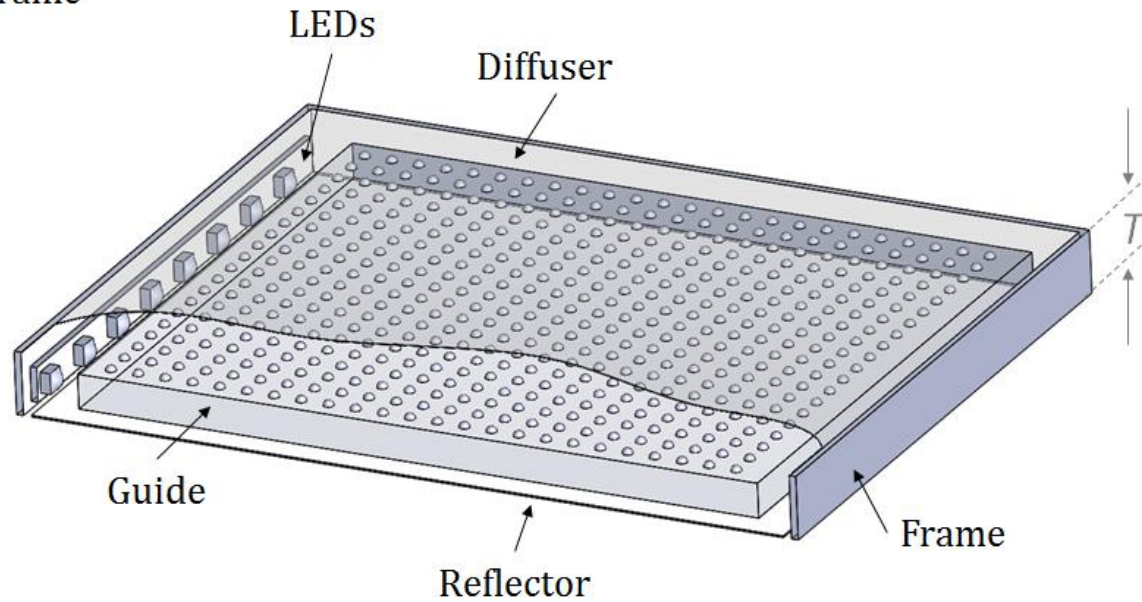
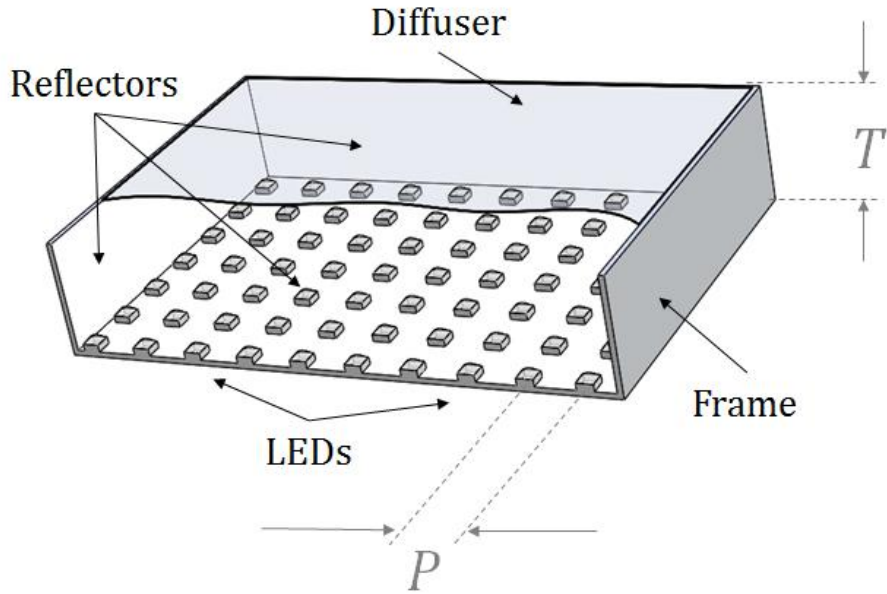


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Large area
Beam shaping
Light mixing

Large-Area LED modules

Direct-lit

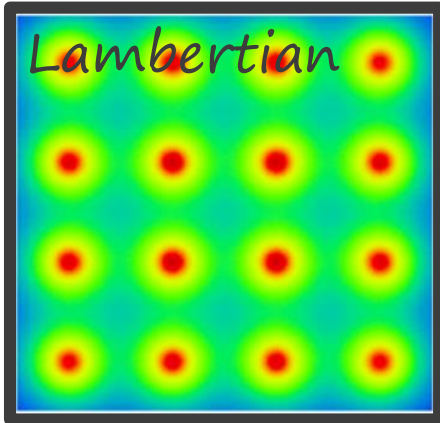


Edge-lit

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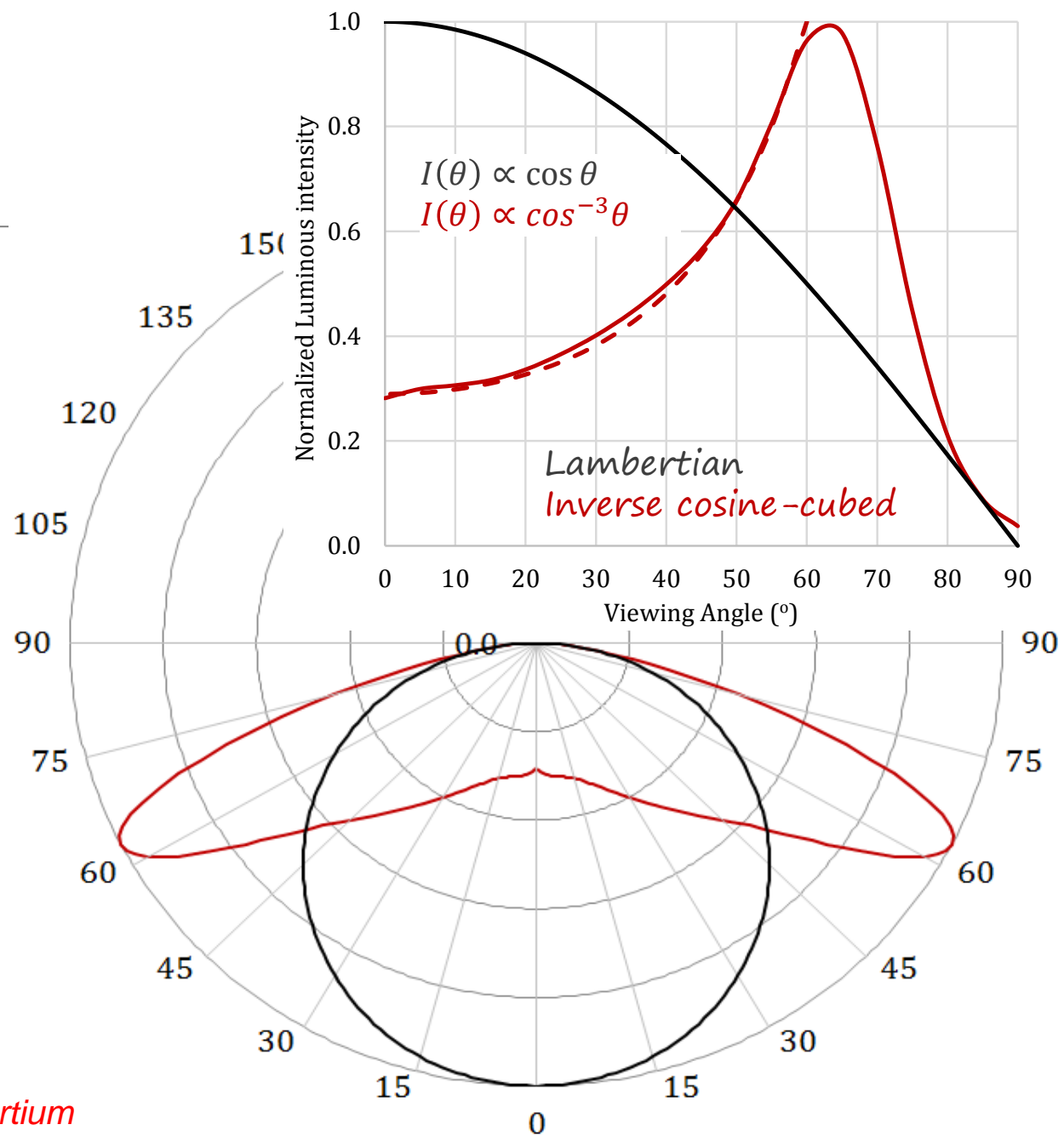
Beam-shaping

Radiance distribution

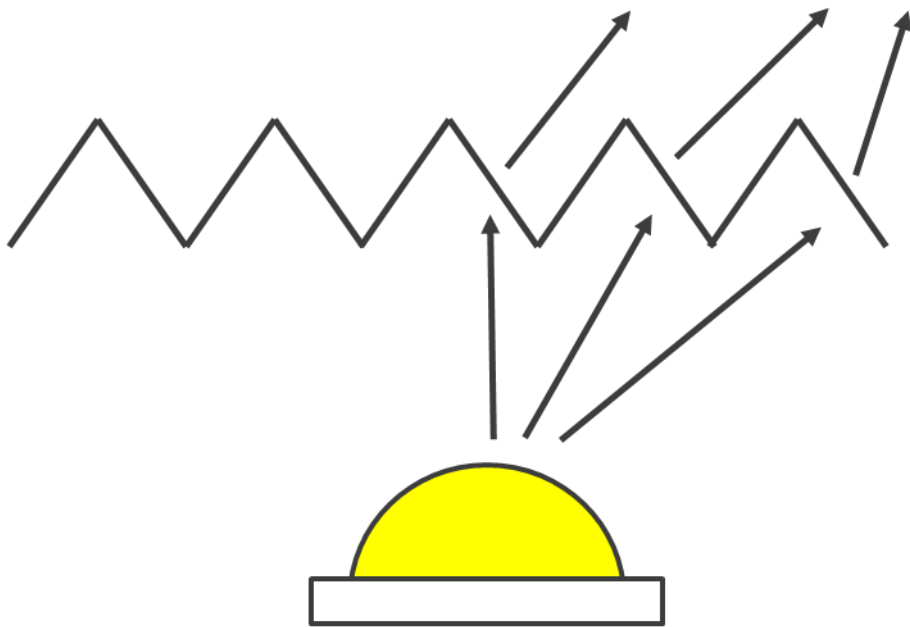


$P=30\text{mm}$; $T=15\text{mm}$

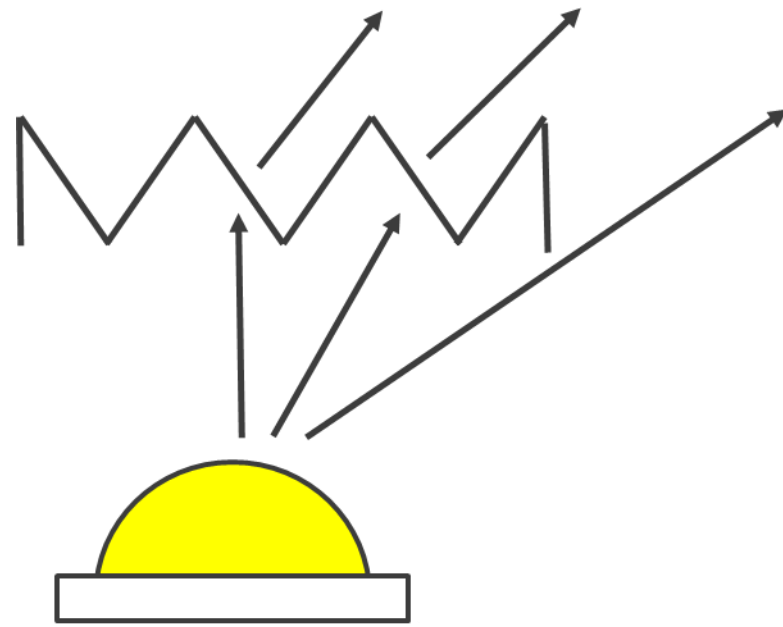
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Beam shaping optical pixels

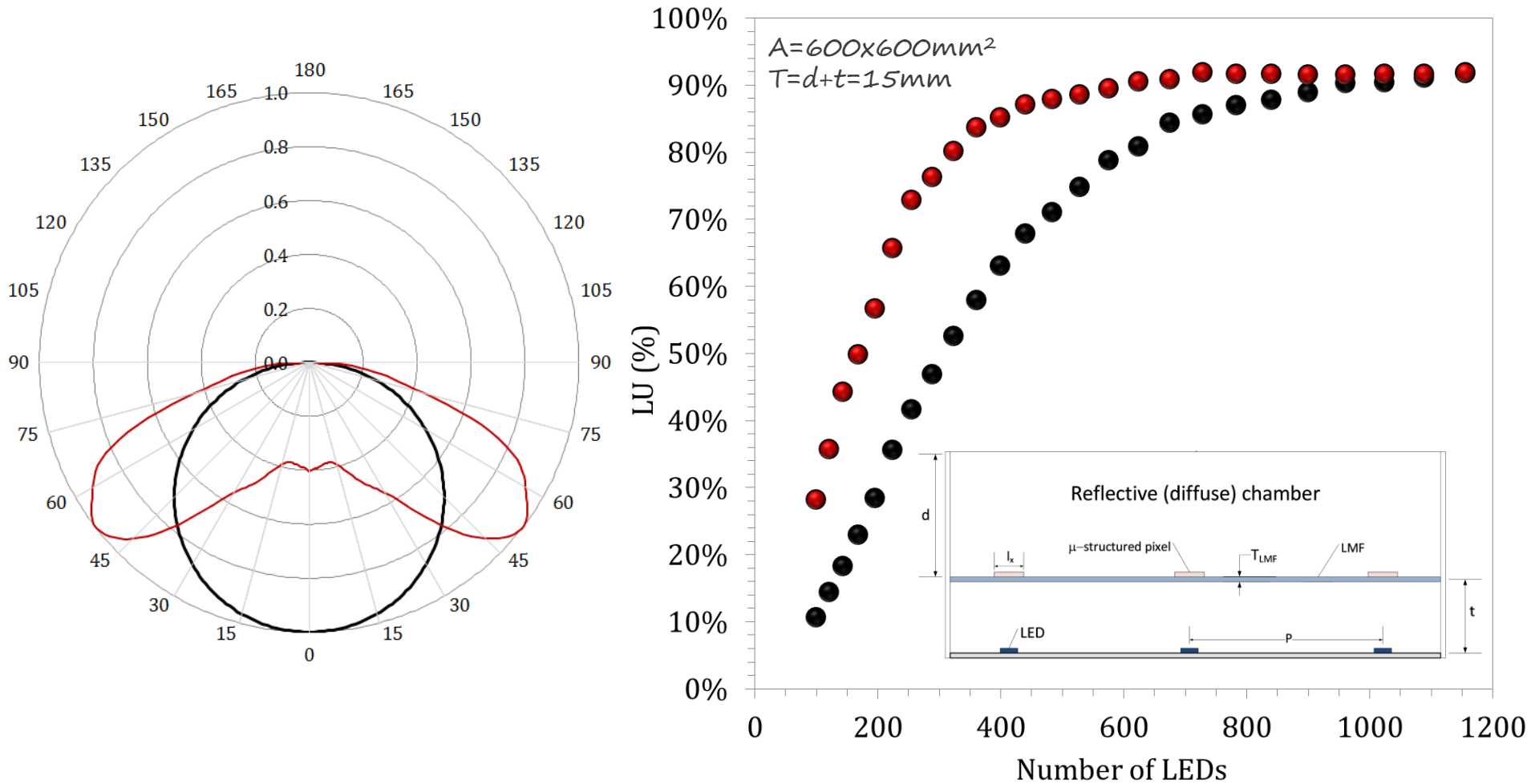


Periodic microstructures



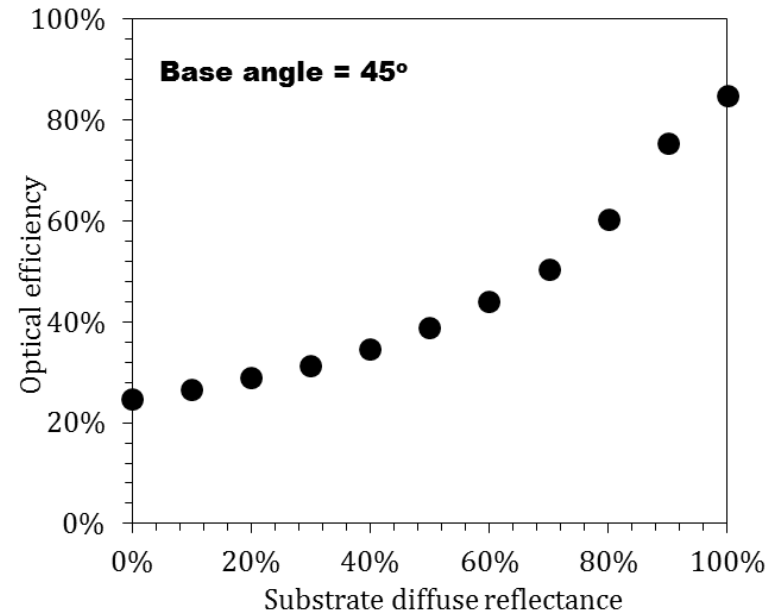
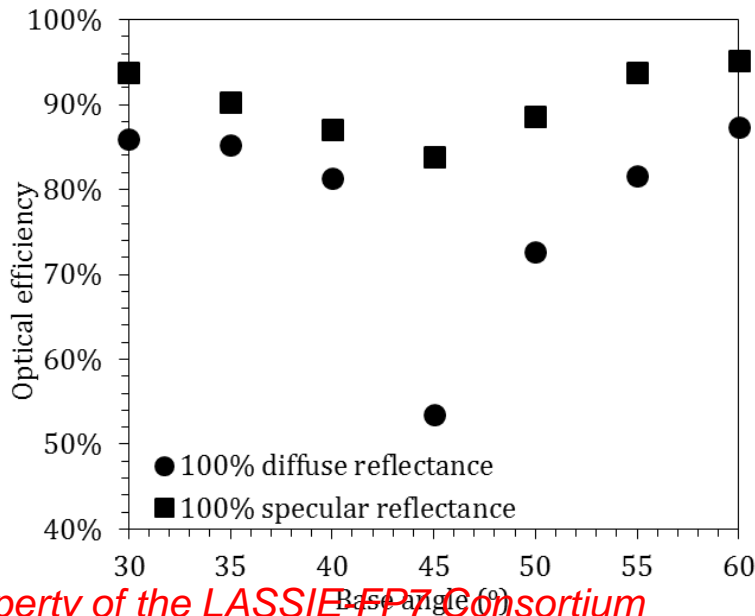
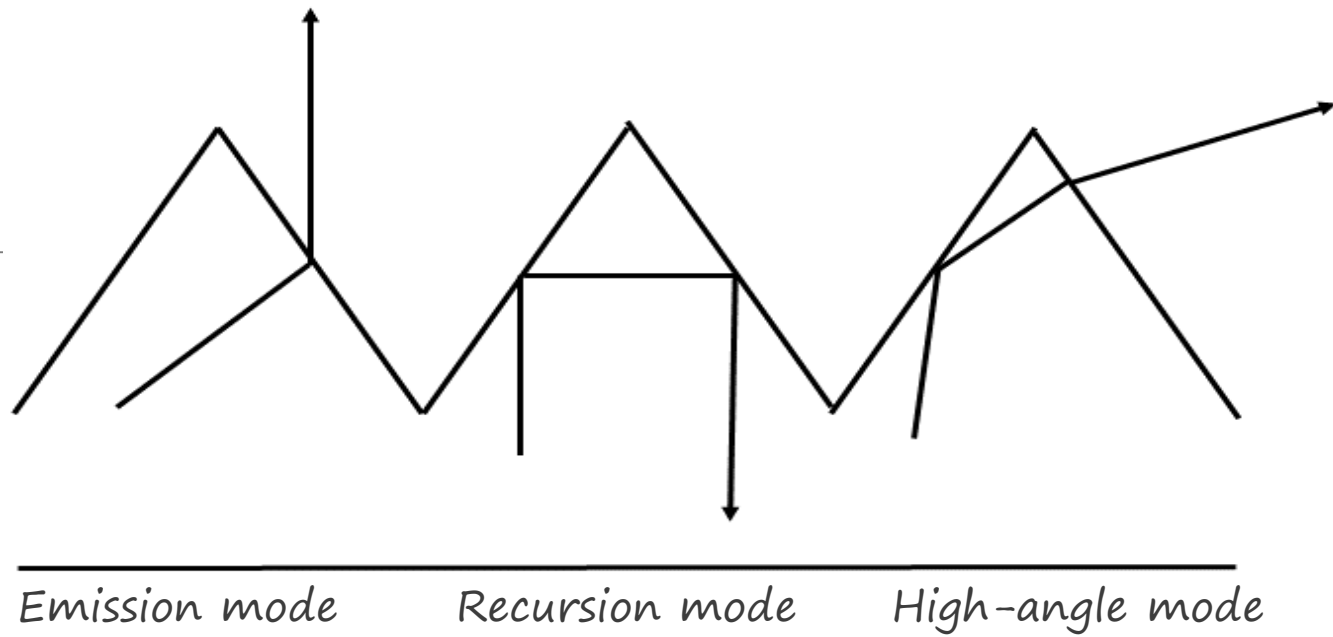
Microstructured pixel

Beam shaping optical pixels



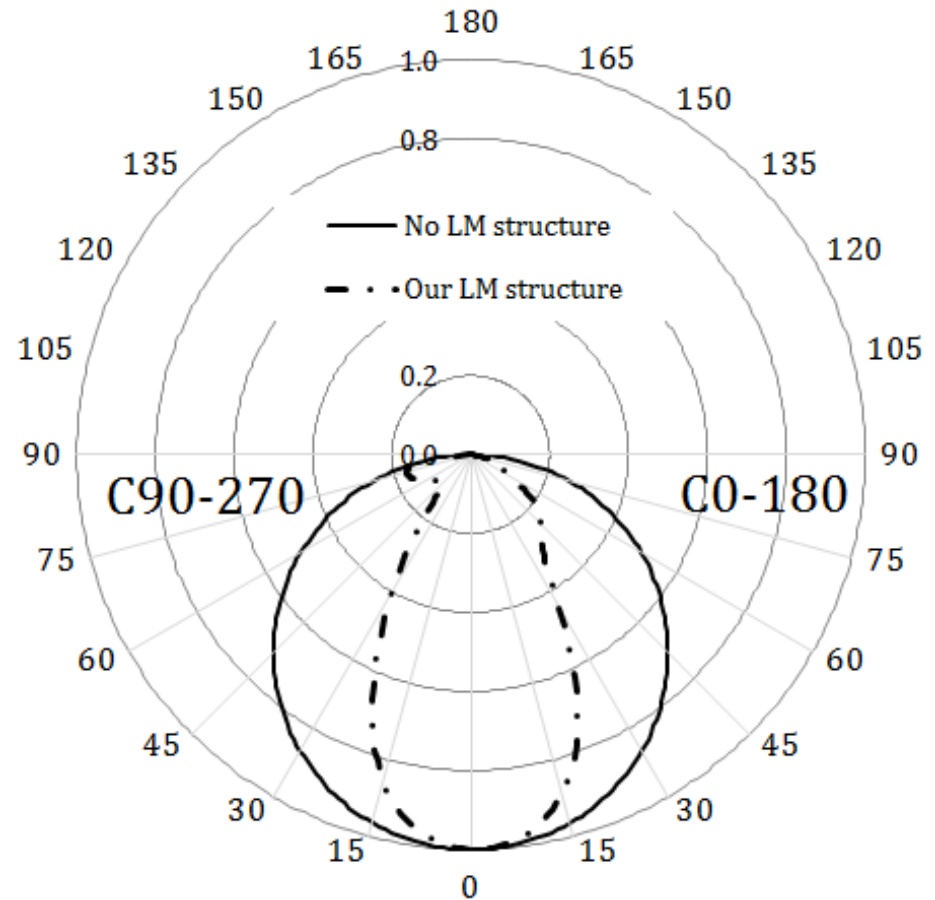
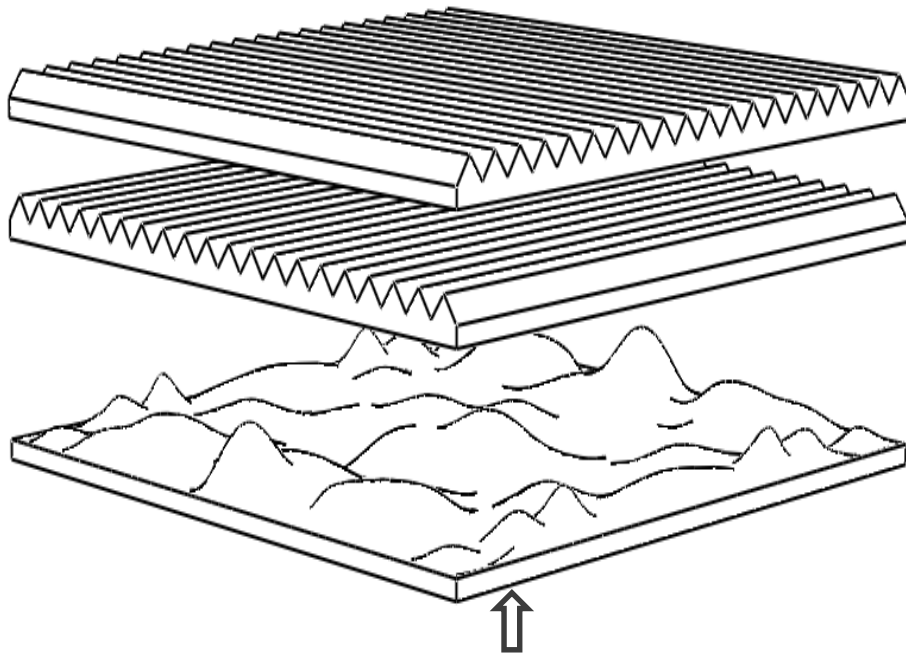
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Light mixing



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Bright Enhancement Foils (for displays)



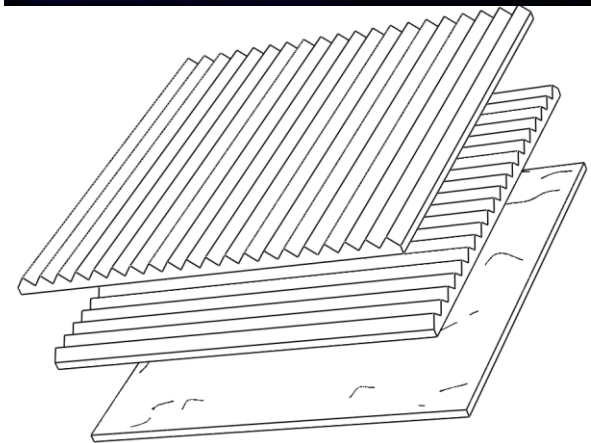
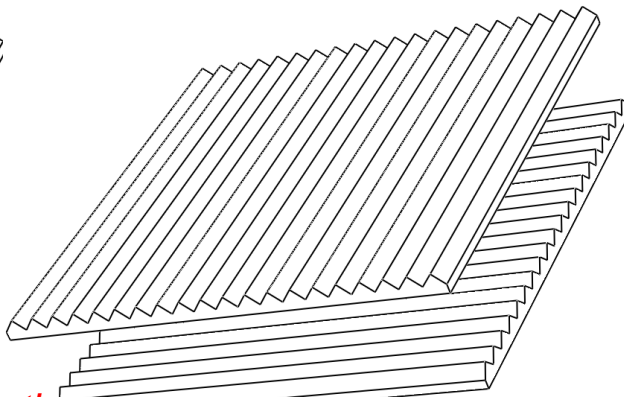
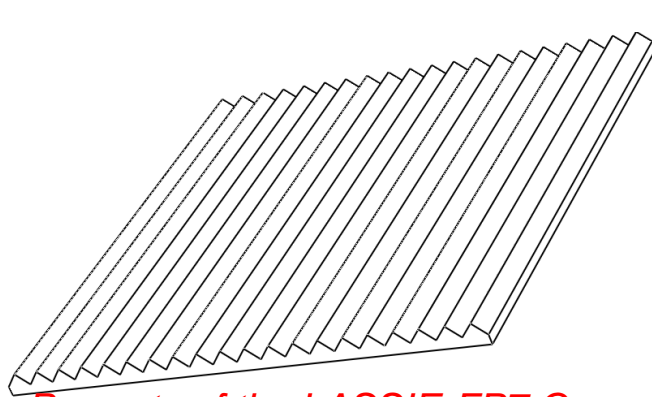
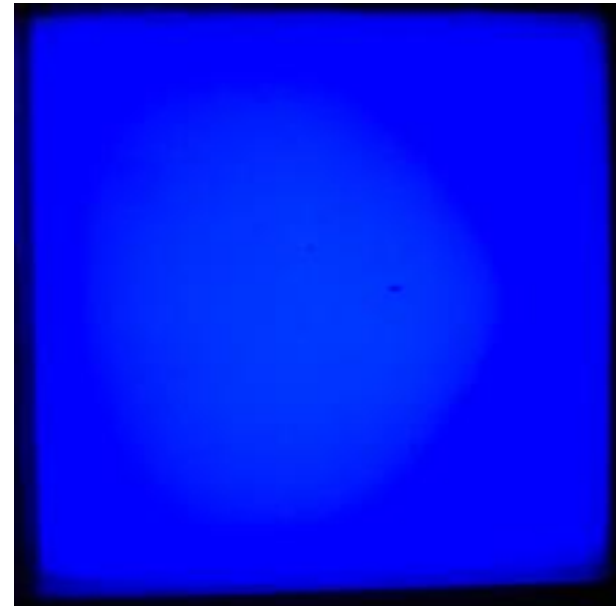
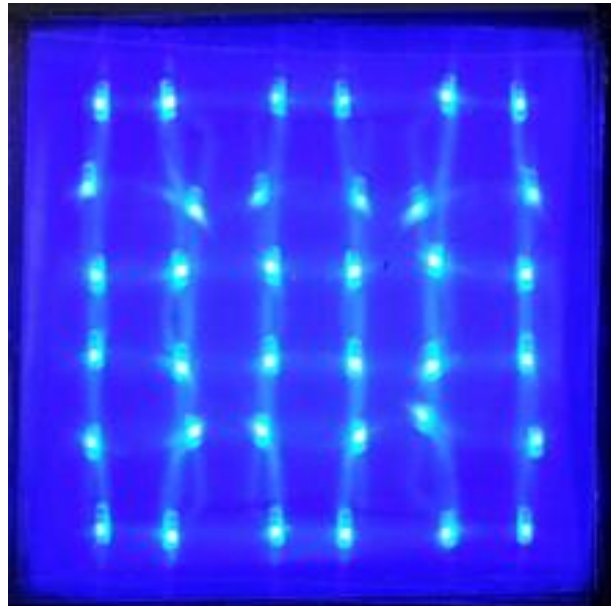
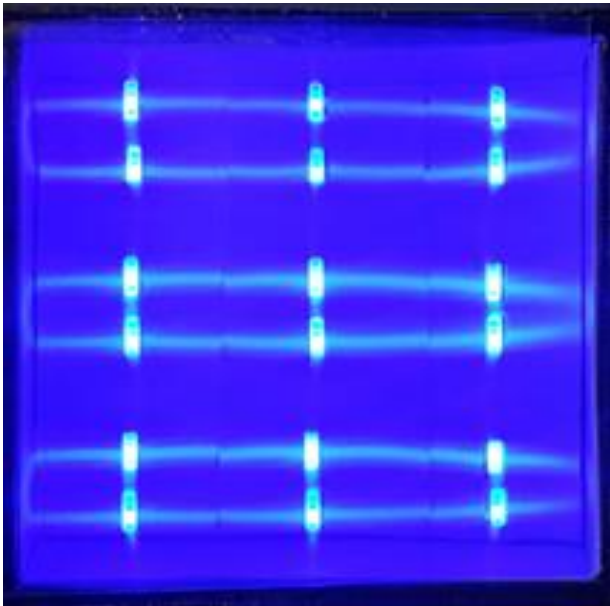
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Bright Enhancement Foils (for displays)



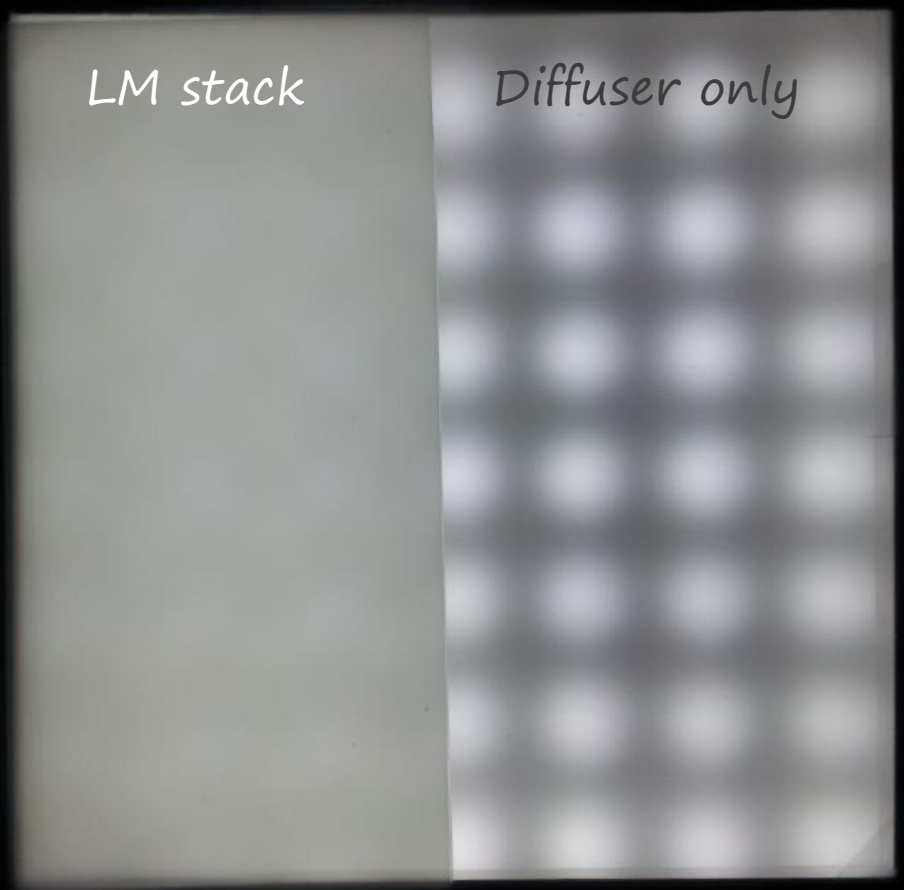
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Bright Enhancement Foils (for displays)



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Light recycling prismatic foils



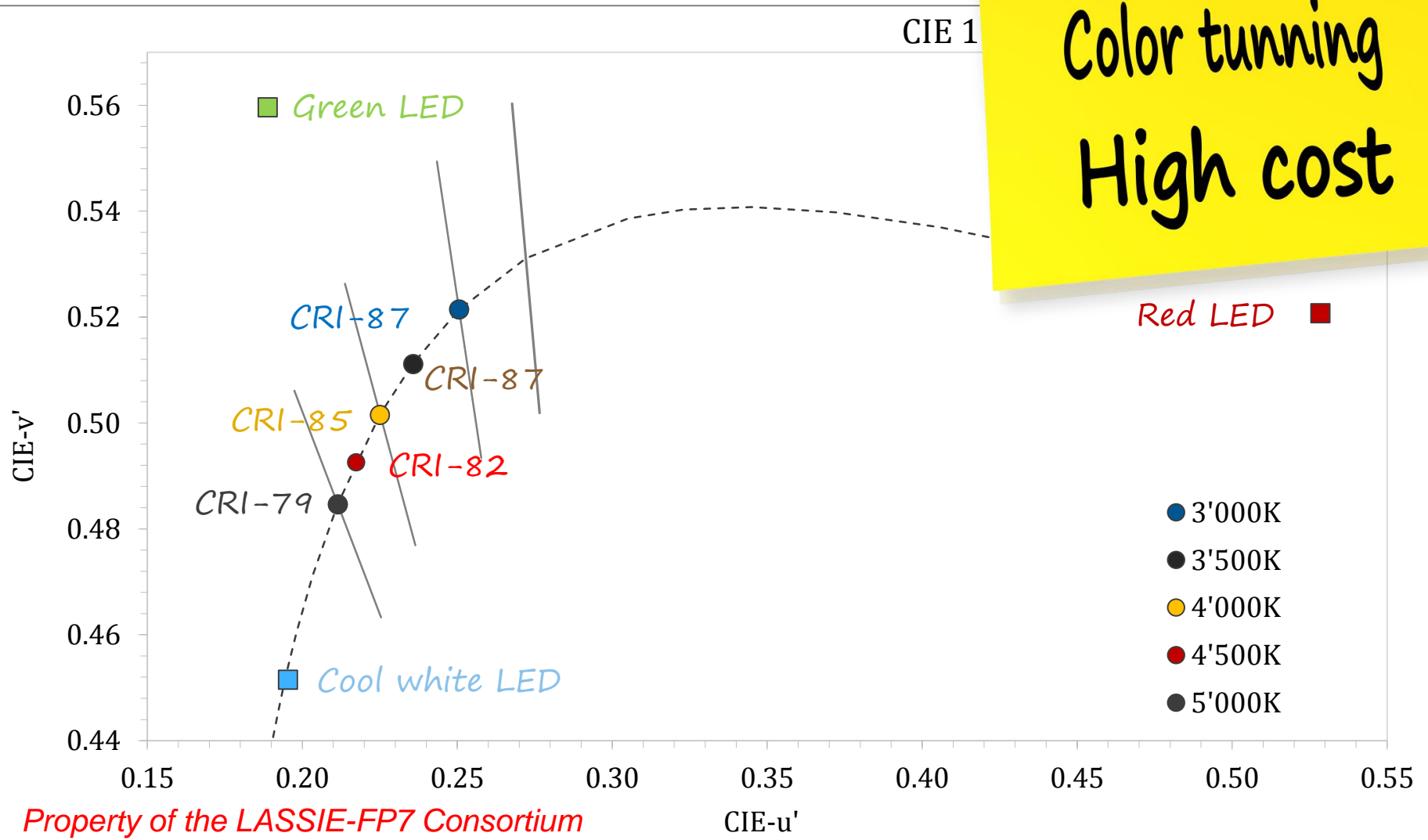
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Multicolor LEDs

Down-conversion

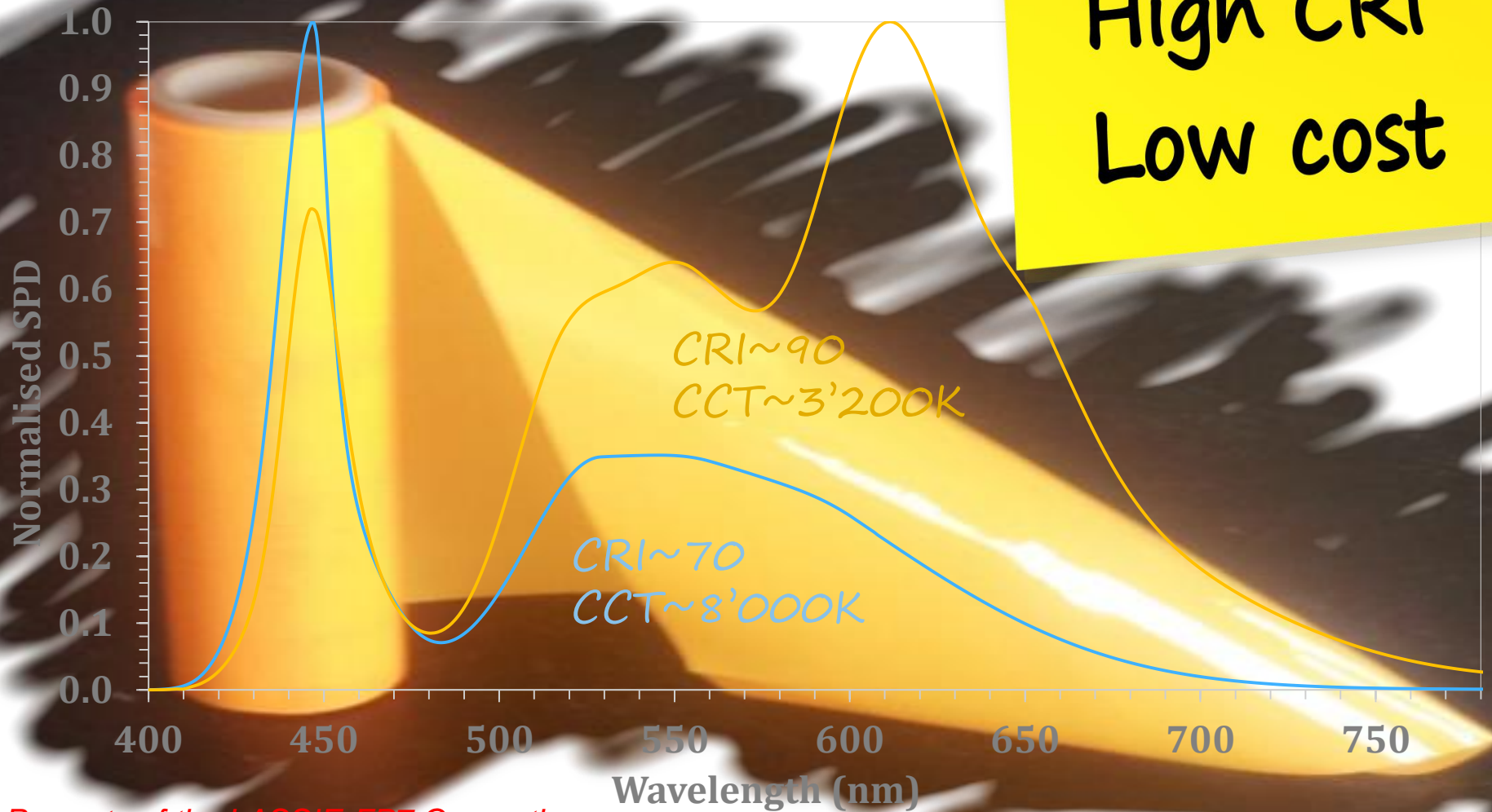
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Multicolour LEDs



Organic-based down-converting phosphor

High CRI
Low cost



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Thank you

