



Record performance of Tx metalens

SINGLE-SURFACE METALENS EXTREME FOI DIFFUSER WITH BATWING PROFILE

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Technical specification of the record performance single-surface metalens, creating an Extreme Field of Illumination Diffuser with batwing profiles and no visible Zero order. The diffuser is characterized using a VCSEL light source.

Extreme Field of Illumination Diffuser Specifications

λ [nm]	FOI (X*Y) [°]	Efficiency [%]	Batwing amplitude (peak value compared to centre of profile measured in angular space)		
940	150 x 120	~60%	1.7 (x cross-section)	1.2 (y cross-section)	2.3 (diagonal)

VCSEL Specifications

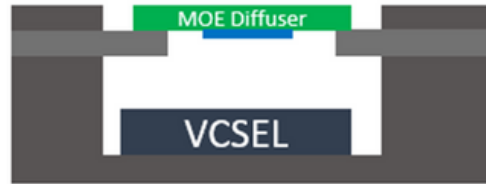
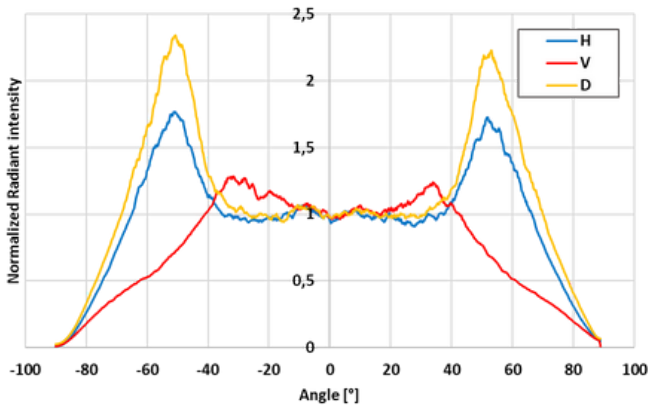
λ [nm]	Divergence angle [°]	Number of emitters	VCSEL emitter area (X*Y) [mm]
940	24	180 in hexagonal arrangement	0.6 X 0.925

NILT has designed and is demonstrating a meta optical element (MOE) diffuser with an extreme field of illumination (eFOI), a profile that has no visible Zero Order in the center and has prominent batwing at the edges, which pre-compensates for the relative illumination drop-off that occurs in cameras at high angles. Potential applications of such an eFOI diffuser include in-cabin monitoring that can be used for intruder detection in cars and 360° monitoring by industrial robots for safety purposes and proximity sensing. NILT's technology platform is ready to enable customized designs for a wide range of applications and customer specifications.



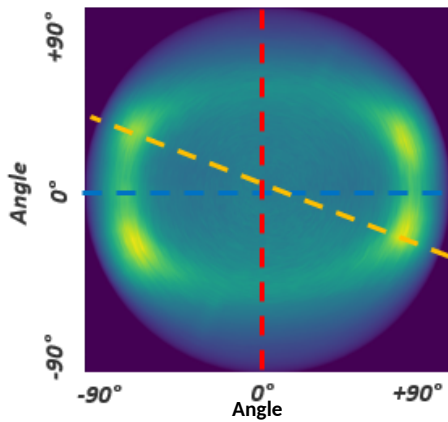
Projected profile of eFOI NIR MOE diffuser

Cross section extraction of radiant intensity in angular space

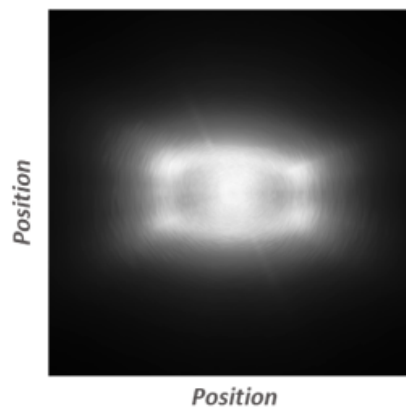


A schematic module geometry that shows the simplicity of using a single optical surface to produce flood illumination with batwing profile

Radiant intensity in angular space



2D image projected on a screen



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About NILT

NIL Technology ApS (NILT), founded in 2006, is an advanced optical solutions company designing, developing, and manufacturing optical elements and components using high-precision nanoscale features. The company is backed by several industry-independent investors: Jolt Capital, NGP Capital, Swisscanto, Vækstfonden, and the European Innovation Council (EIC).

NILT creates competitive advantages with flat optics in optical applications for 3D sensing, consumer electronics, machine vision, autonomous vehicles, telecommunication, and AR/VR/MR displays. NILT is based in Denmark and has offices in Switzerland, Sweden, Malaysia, and the US. Visit us at www.nilt.com.