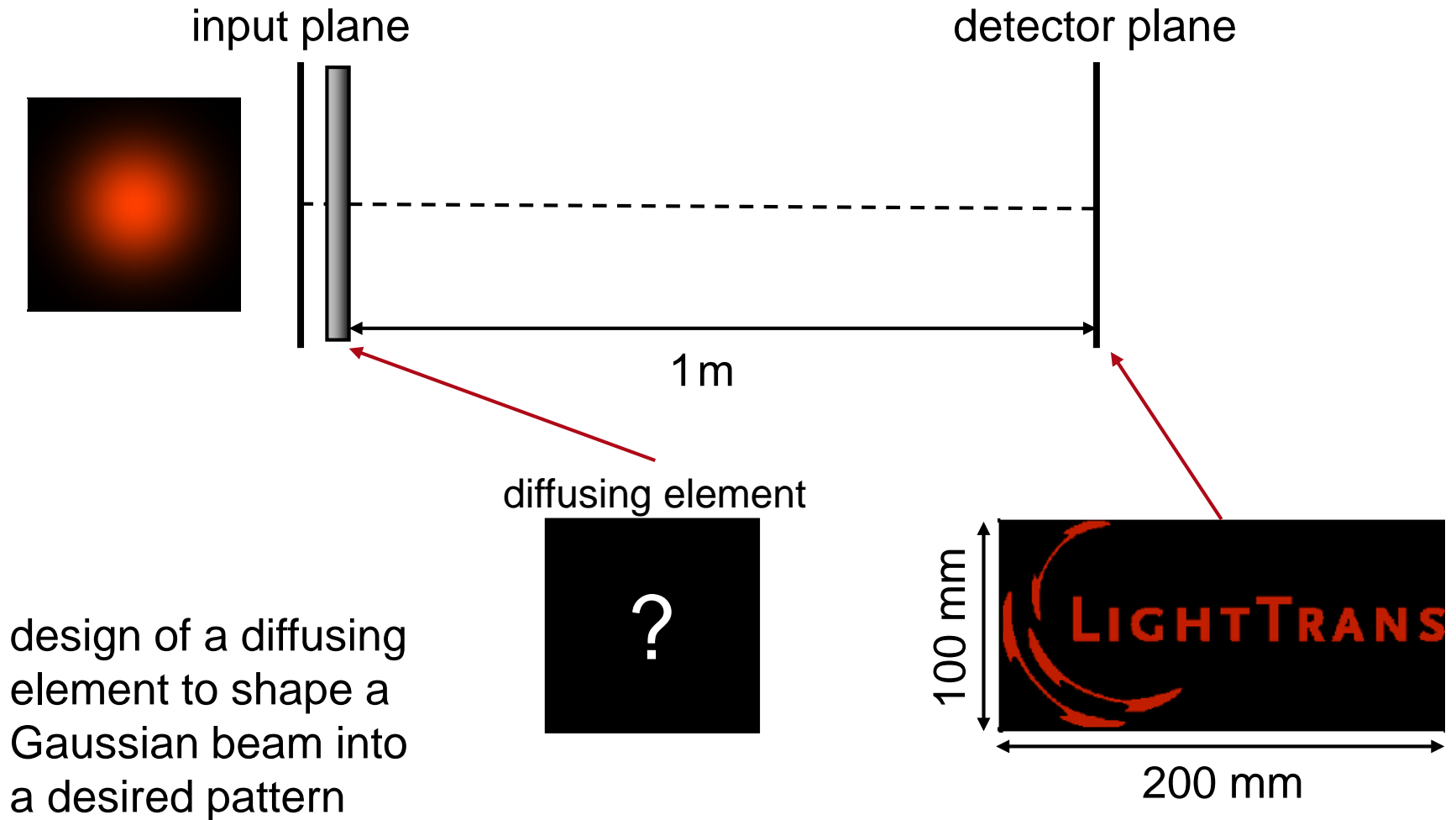


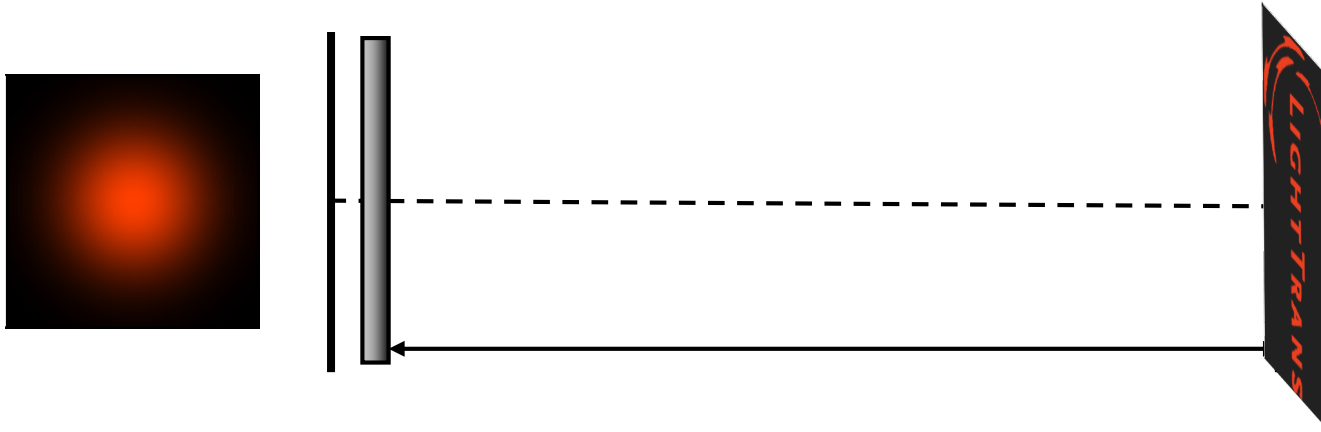
Light Shaping > Diffusers

Design of a Diffuser to Generate a LightTrans Mark

Task Illustration

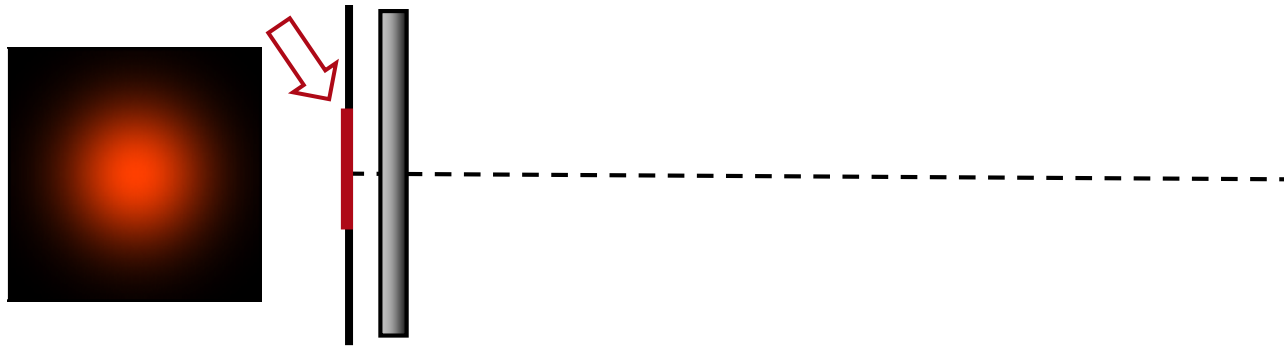


Highlights



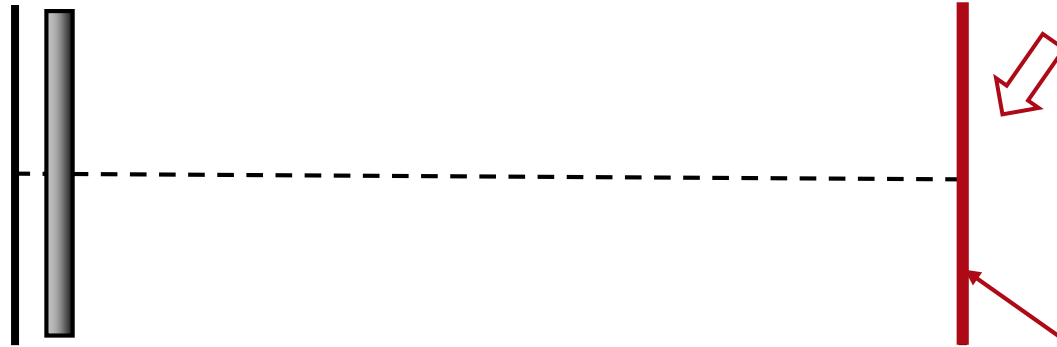
- user-friendly guided design of a beam shaping diffuser
- optimization of the design regarding fabrication constrains
- analysis of fabrication tolerances

Specification: Light Source

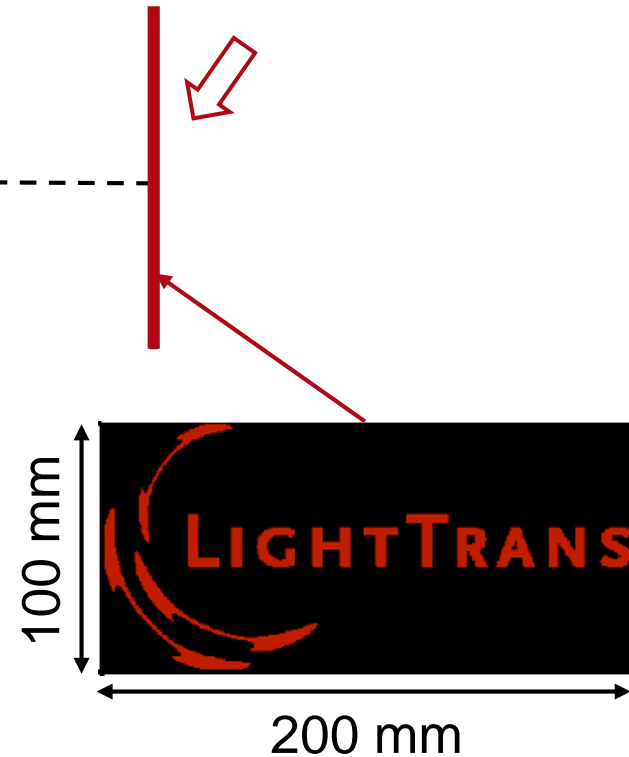


Parameter	Description / Value & Unit
type/number	Gaussian beam
coherence/mode	single Hermite Gaussian (0,0) mode
wavelength	650nm
beam diameter ($1/e^2$)	1 mm \times 1 mm

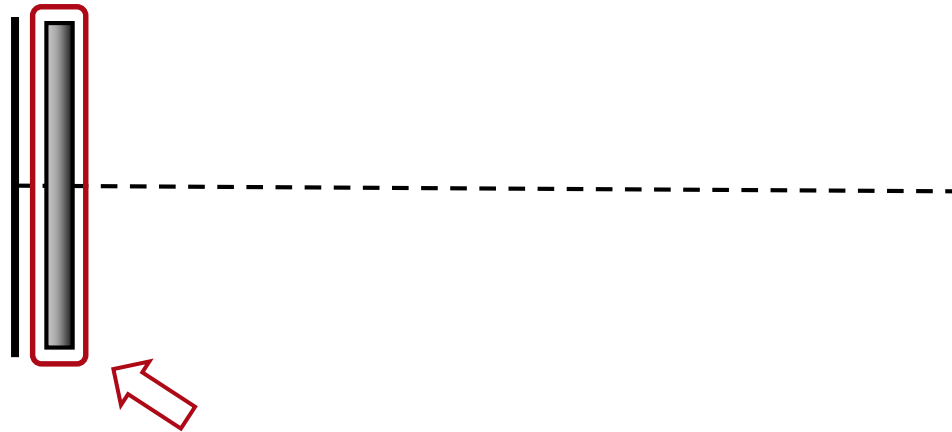
Specification: Desired Pattern



Parameter	Description / Value & Unit
type	imported bitmap file
wavelength	650nm
size	2m x 1m

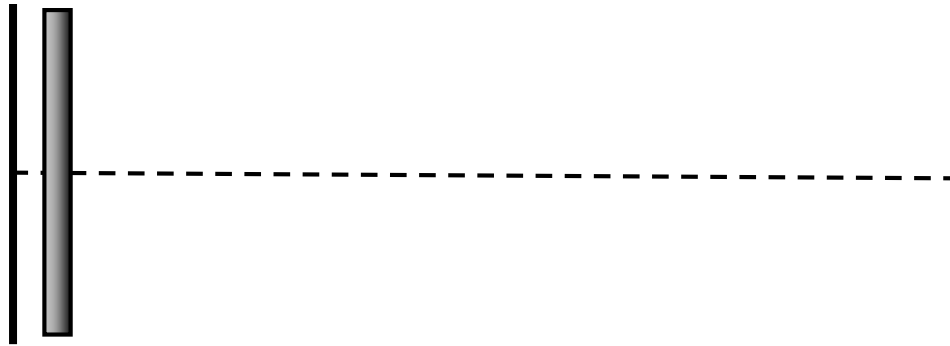


Specification: Diffuser to be Designed



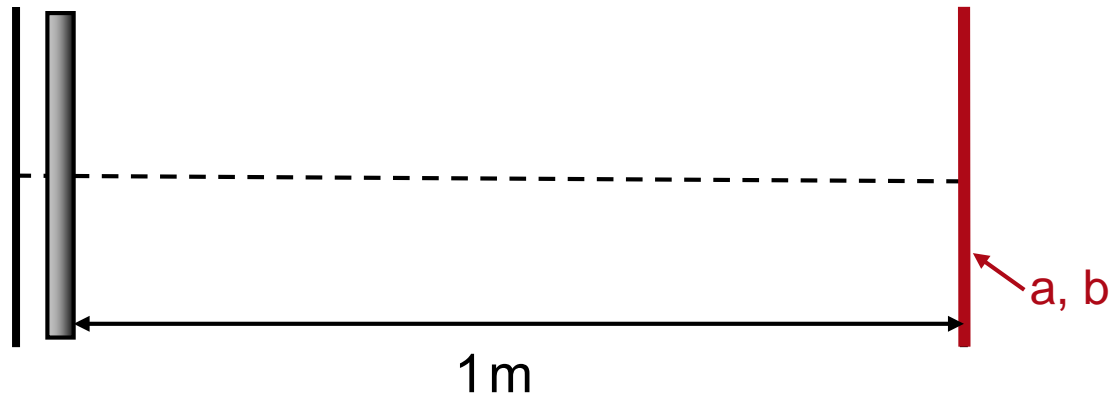
Parameter	Description / Value & Unit
diameter	2mm×2mm
surface type	(a) continuous (b) quantized (4 levels)
thickness	1 mm
material	fused silica

Specification: Design Merit Function



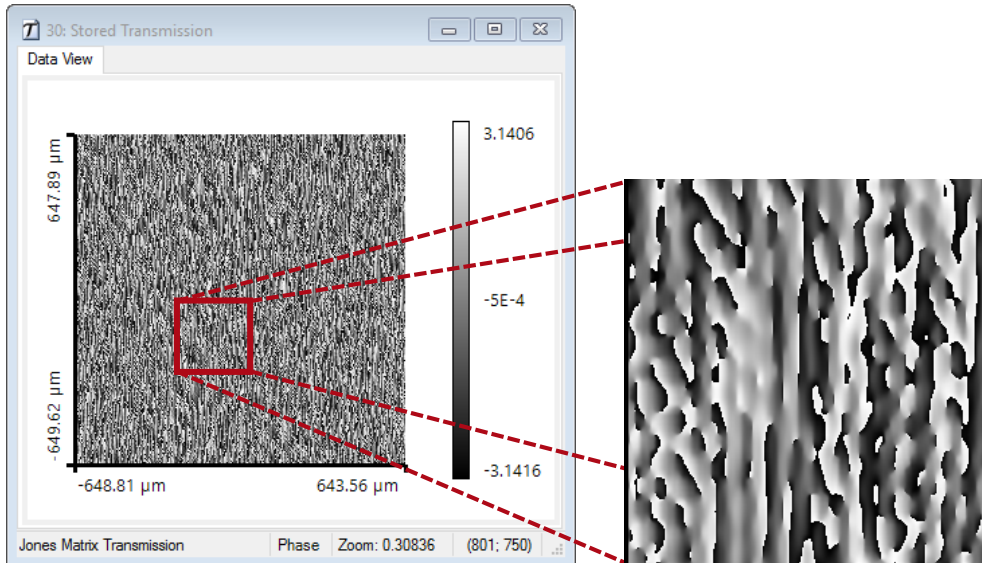
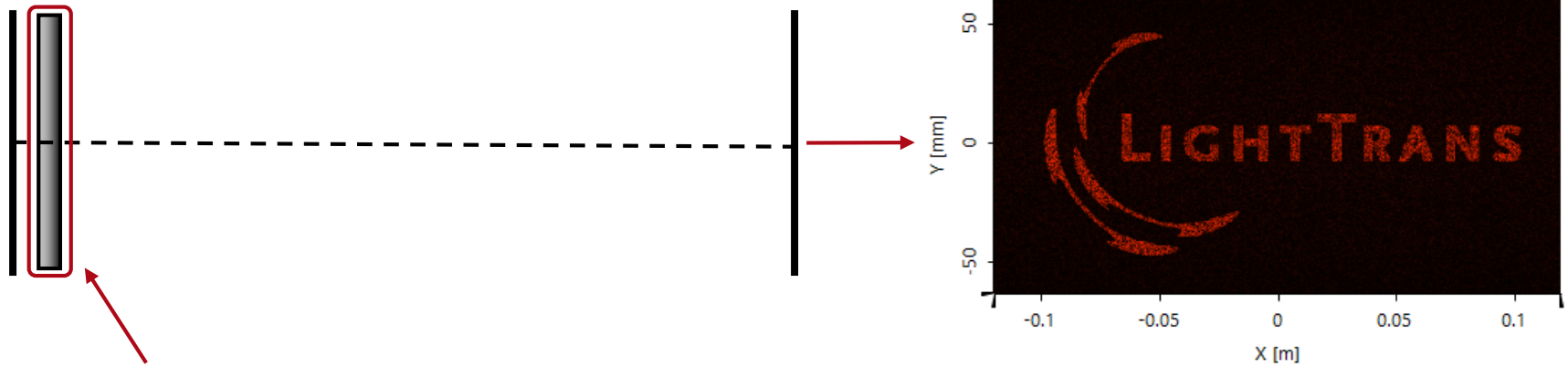
Parameter	Description / Value & Unit
conversion efficiency	> 60%
signal to noise ratio (SNR)	> 25dB
relative intensity of stray light	< 10%

Specification: Detectors



Position	Modeling Technique	Detector/Analyzer
a	field tracing	2D intensity distribution
b	field tracing	merit function detector

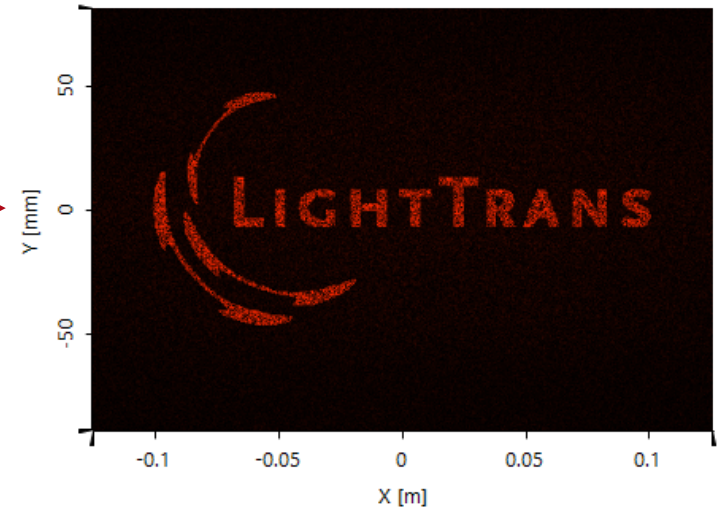
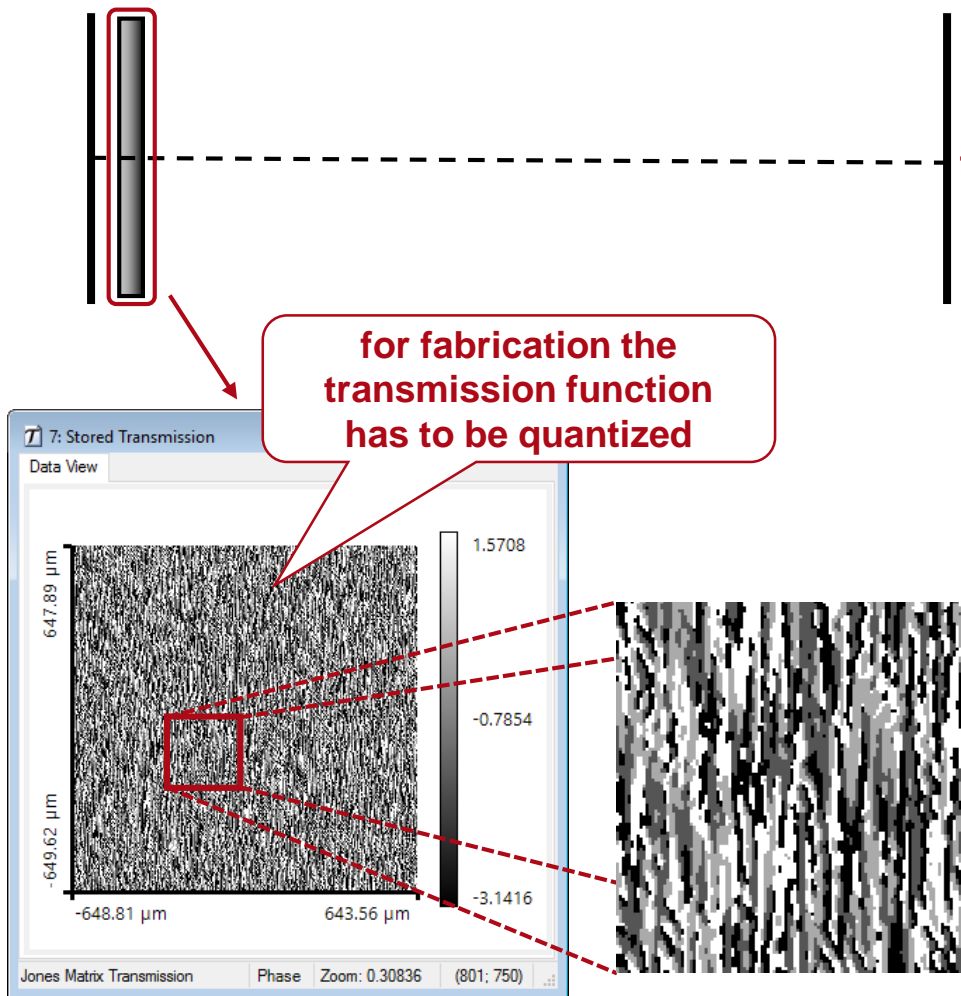
Result: Continuous Transmission Function



merit function detector

Parameter	Value & Unit
conversion efficiency	77.87%
SNR	38.85 dB
stray light max.	9.98%

Result: Optimize Quantization Effects



merit function detector

Parameter	Value & Unit
conversion efficiency	63.86%
SNR	32.13dB
stray light max.	13.99%

Document & Technical Info

code	D.0001
version of document	1.0
title	Design of a Diffuser to Generate a LightTrans Mark
category	Diffuser (D)
created by	Huiying Zhong (LightTrans)
used VL version	7.0.0.29

Specifications of PC Used for Simulation

Processor	i7-5600U (2 CPU cores)
RAM	12GB
Operating System	Windows 10