

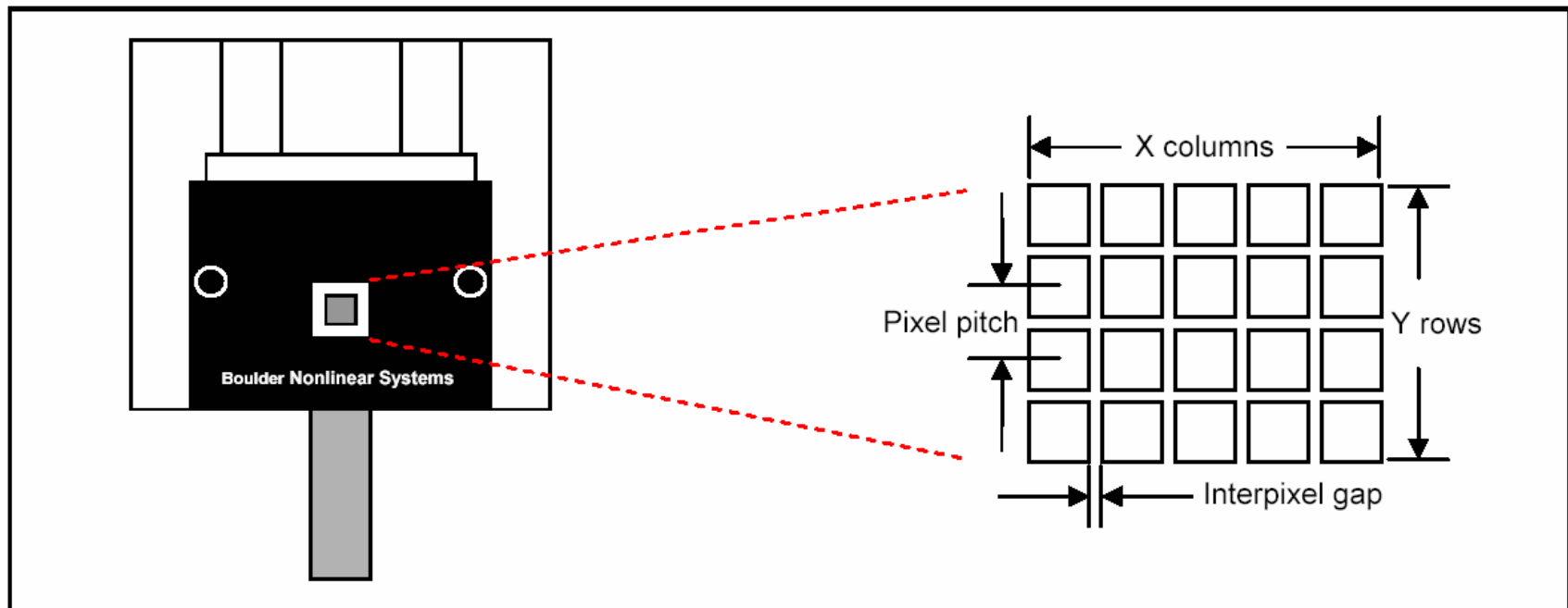
Optické manipulace s využitím prostorového modulátoru světla

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Obsah

- prostorový modulátor světla
- účinnost modulace
- návrh uspořádání pro manipulace
- výsledky

Prostorový modulátor světla (SLM)



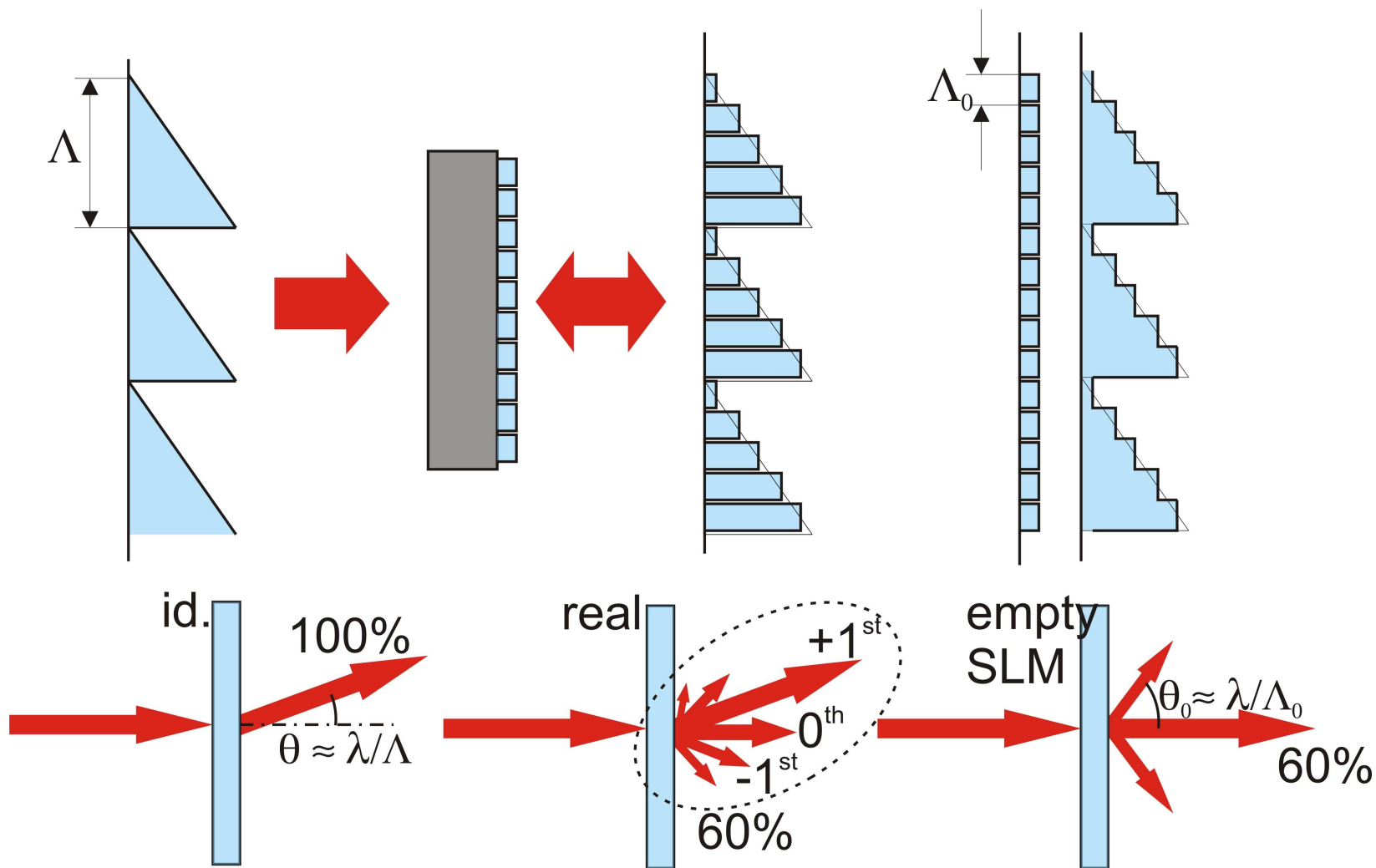
Spatial Light Modulators

XY Phase Series

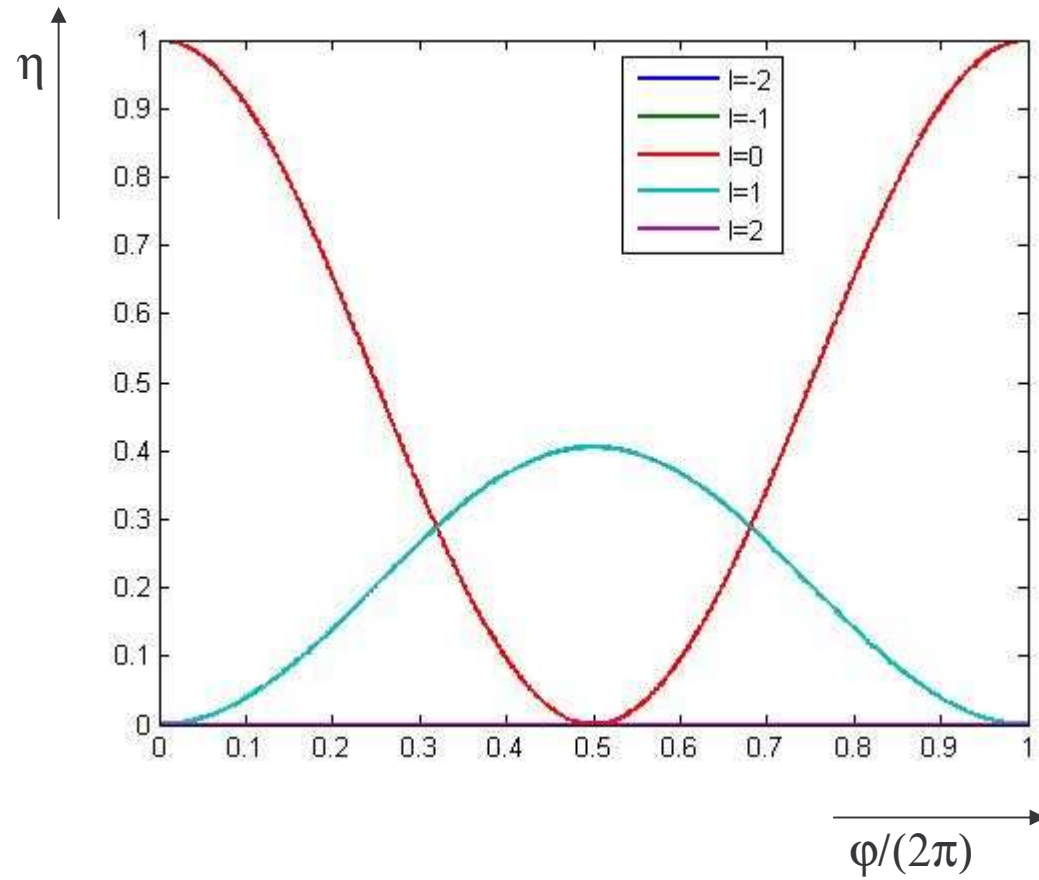
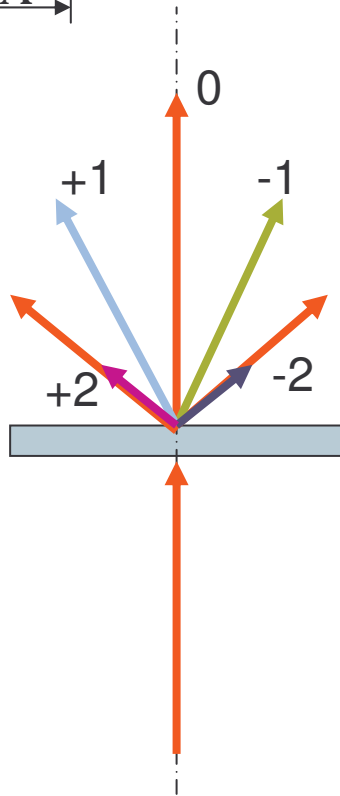
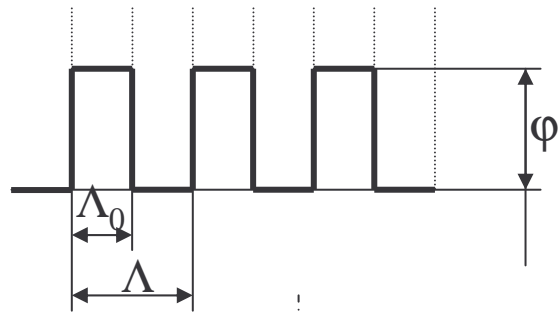
Specifications (Draft)

	Model P256 – λ (nm)	Model P512 – λ (nm)
Array Size	4.61 x 4.61 mm	7.68 x 7.68 mm
Design Wavelength (nominal)	532, 635, 785, 1064, or 1550 nm (specify wavelength, λ in nm when ordering)	
Diffraction Efficiency (zero-order)	63.9% (maximum)	61.5% (maximum)
Duty Cycle	Up to 100%	
External Window ¹	Broadband antireflection coated for $R_{avg} < 1\%$ (over 450 – 865 nm or 850 – 1650 nm).	
Fill Factor	85.0%	83.4%
Format	256 x 256 (65,536 active pixels)	512 x 512 (262,144 active pixels)
Mode	Reflective	
Modulation	Controllable index of refraction	
Phase Levels (resolvable)	50 linear levels (minimum) for 2π phase stroke	
Phase Stroke (double-pass)	Typically 2π at user-specified laser line	
Pixel Pitch	18 x 18 μm	15 x 15 μm
Reflected Wavefront Distortion (rms) ²	$\lambda/4 - \lambda/10$	$\lambda/3 - \lambda/8$
Response Time ³	33 - 100 ms	33 - 100 ms
Spatial Resolution	27 lp/mm	33 lp/mm
Switching Frequency ³	10 – 30 Hz	10 – 30 Hz

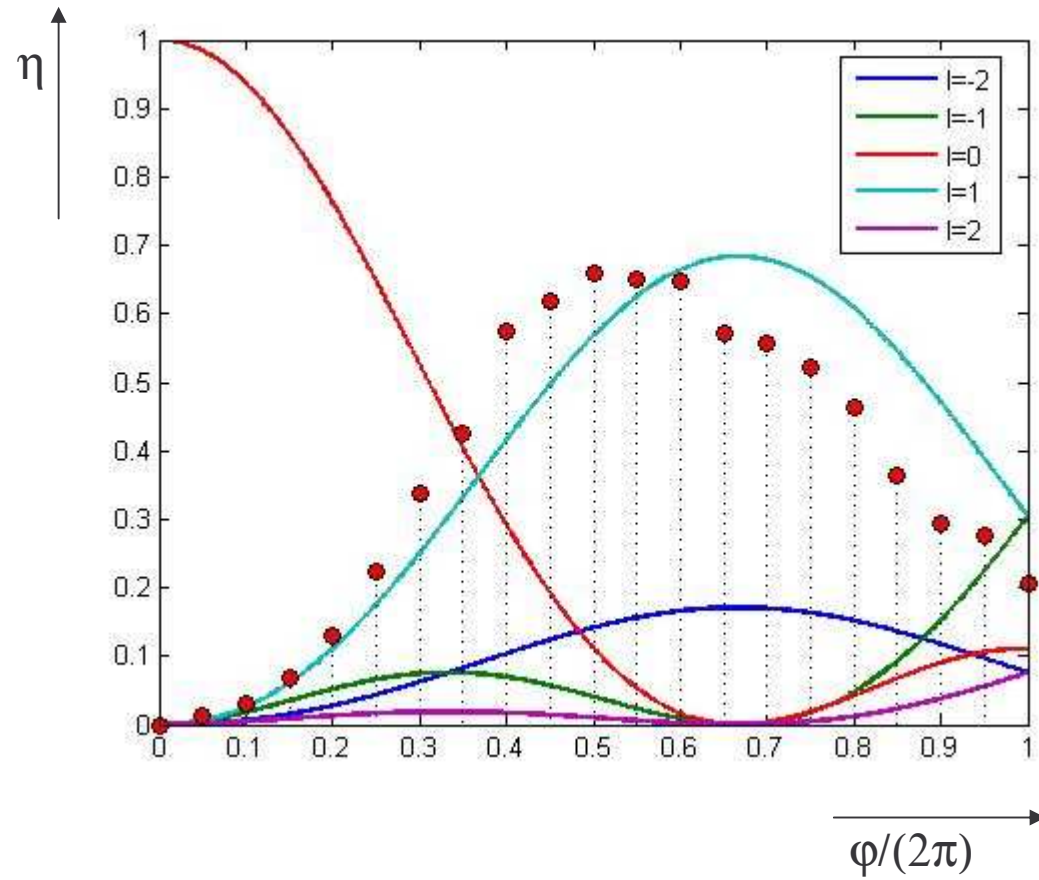
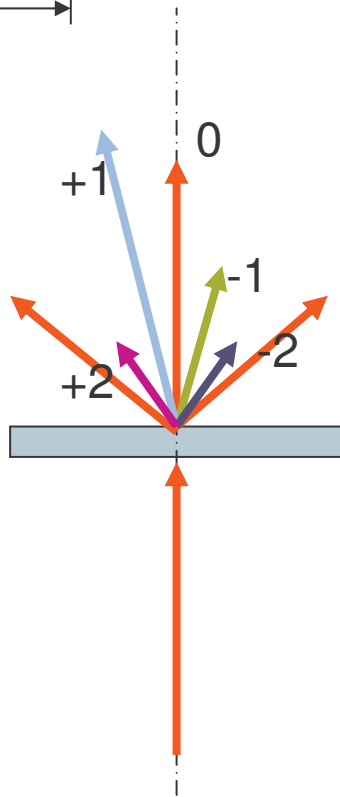
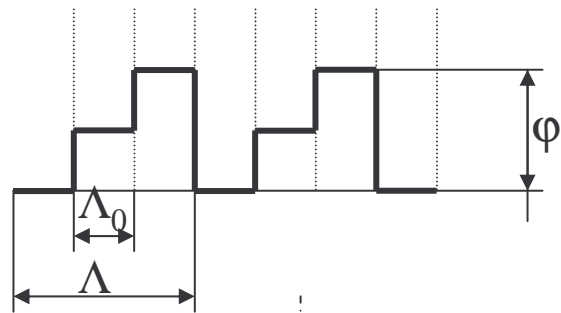
Rozmítání svazku pomocí SLM



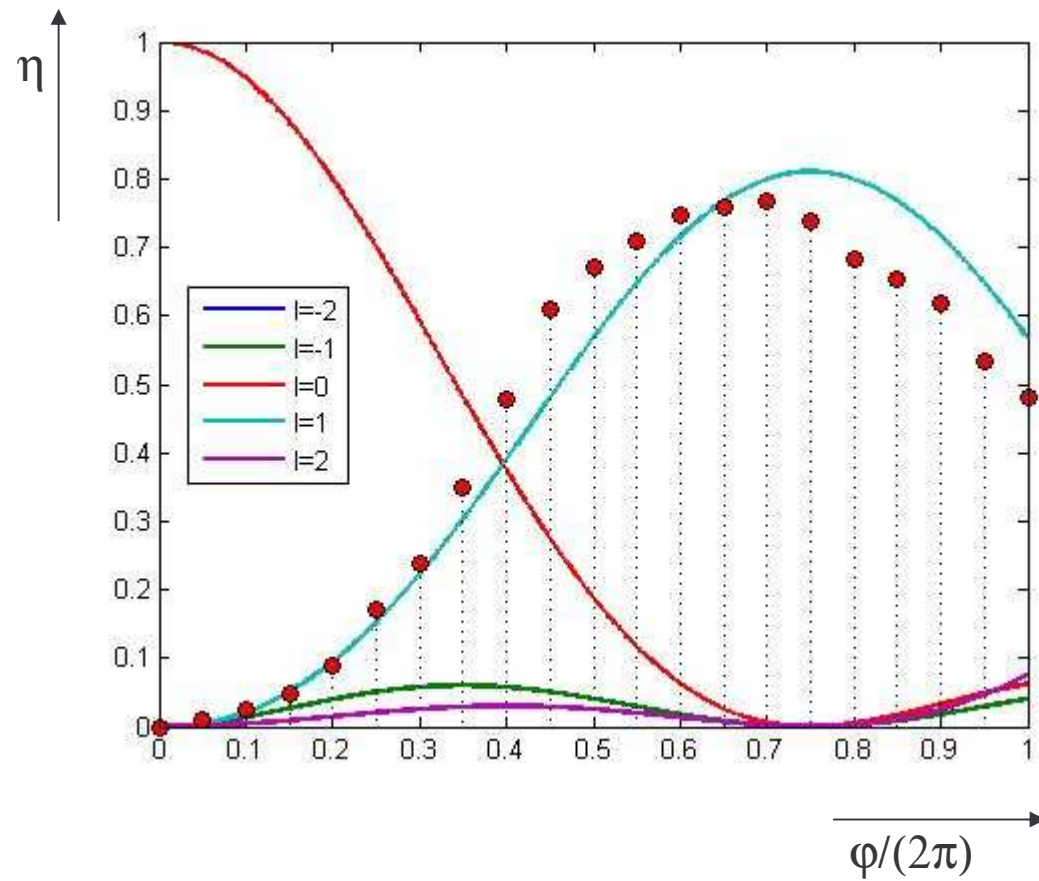
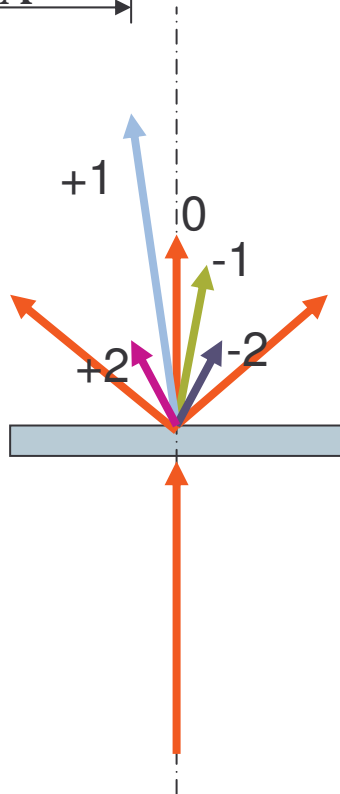
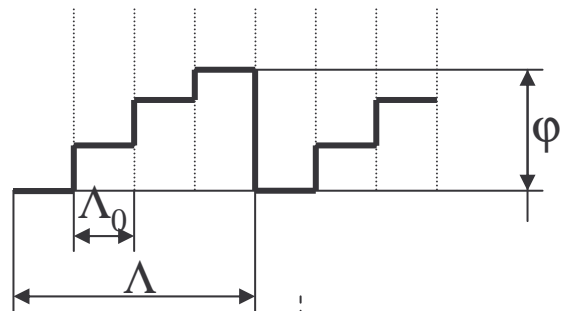
Účinnost modulátoru



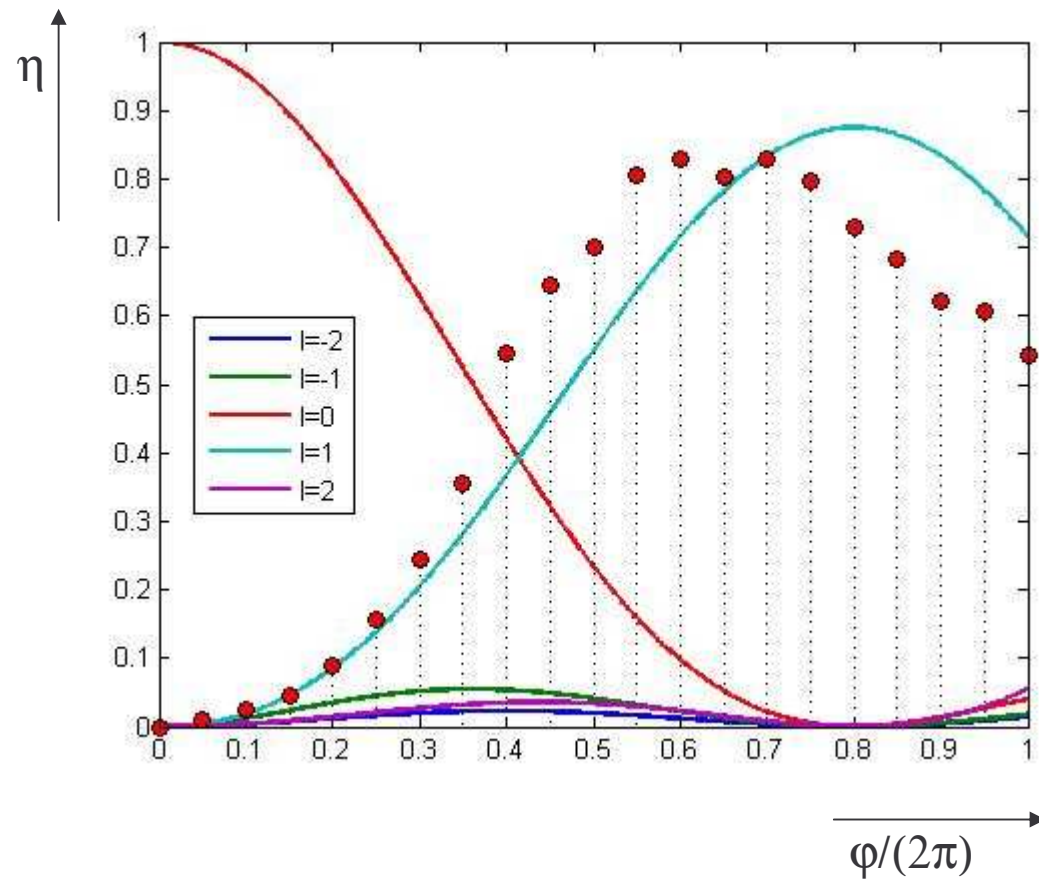
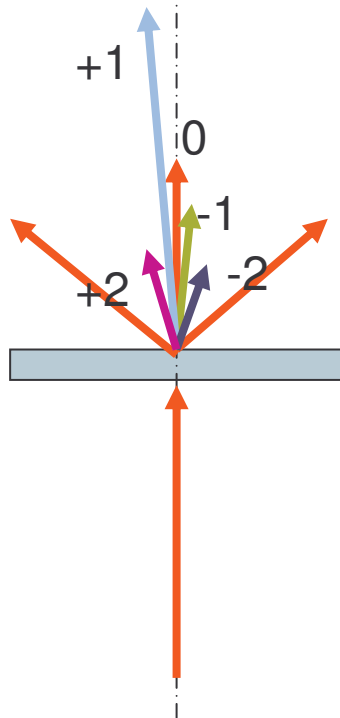
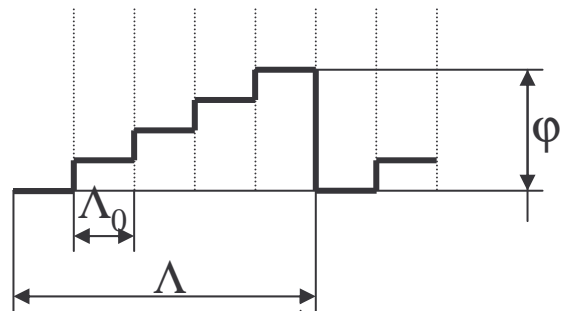
Účinnost modulátoru



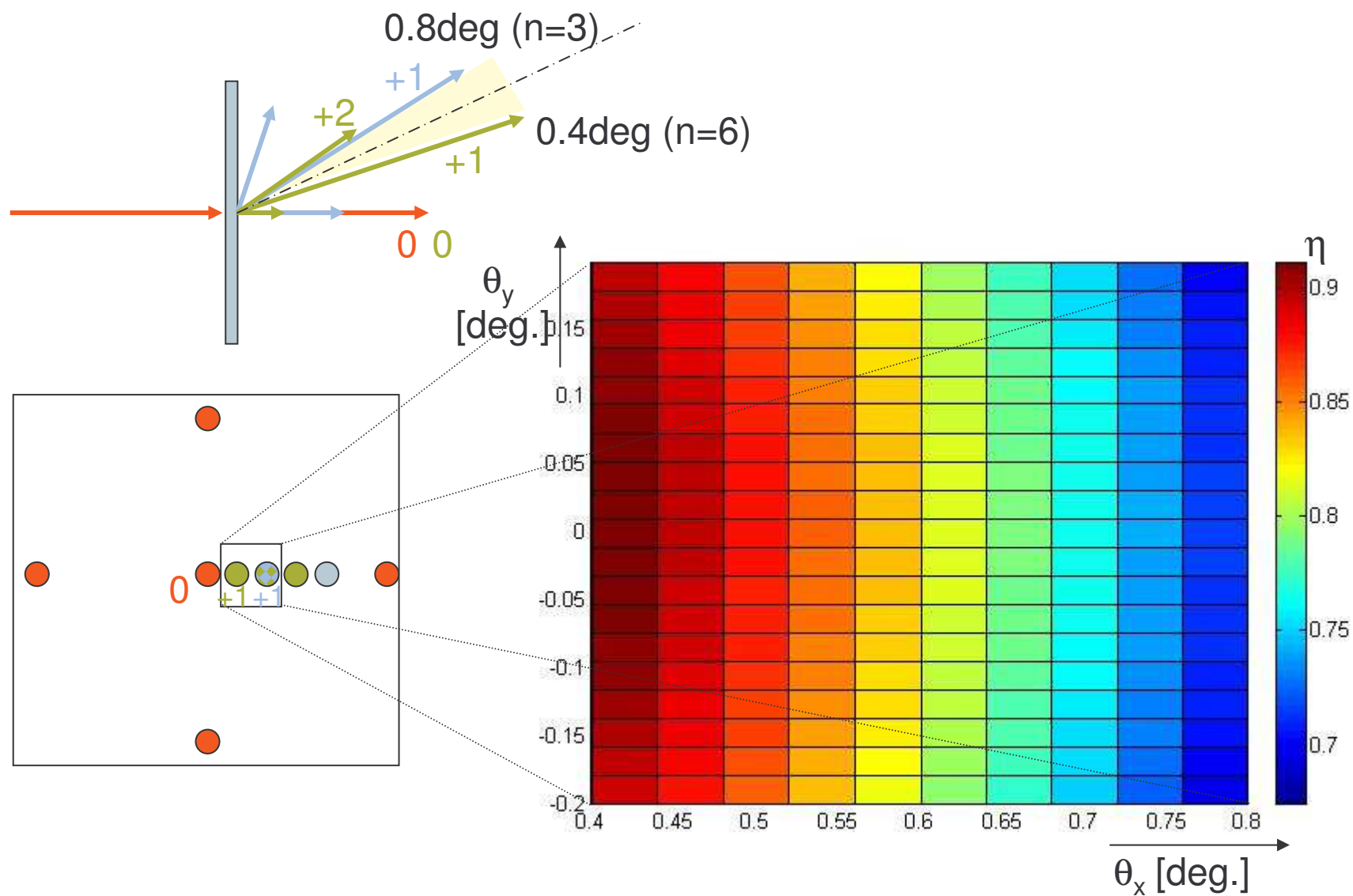
Účinnost modulátoru



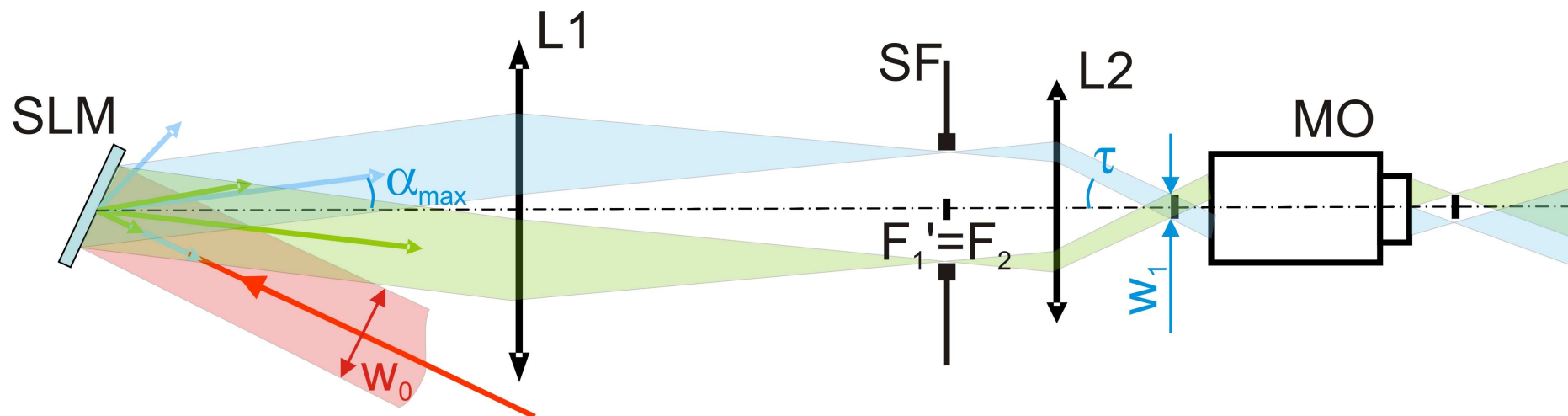
Účinnost modulátoru



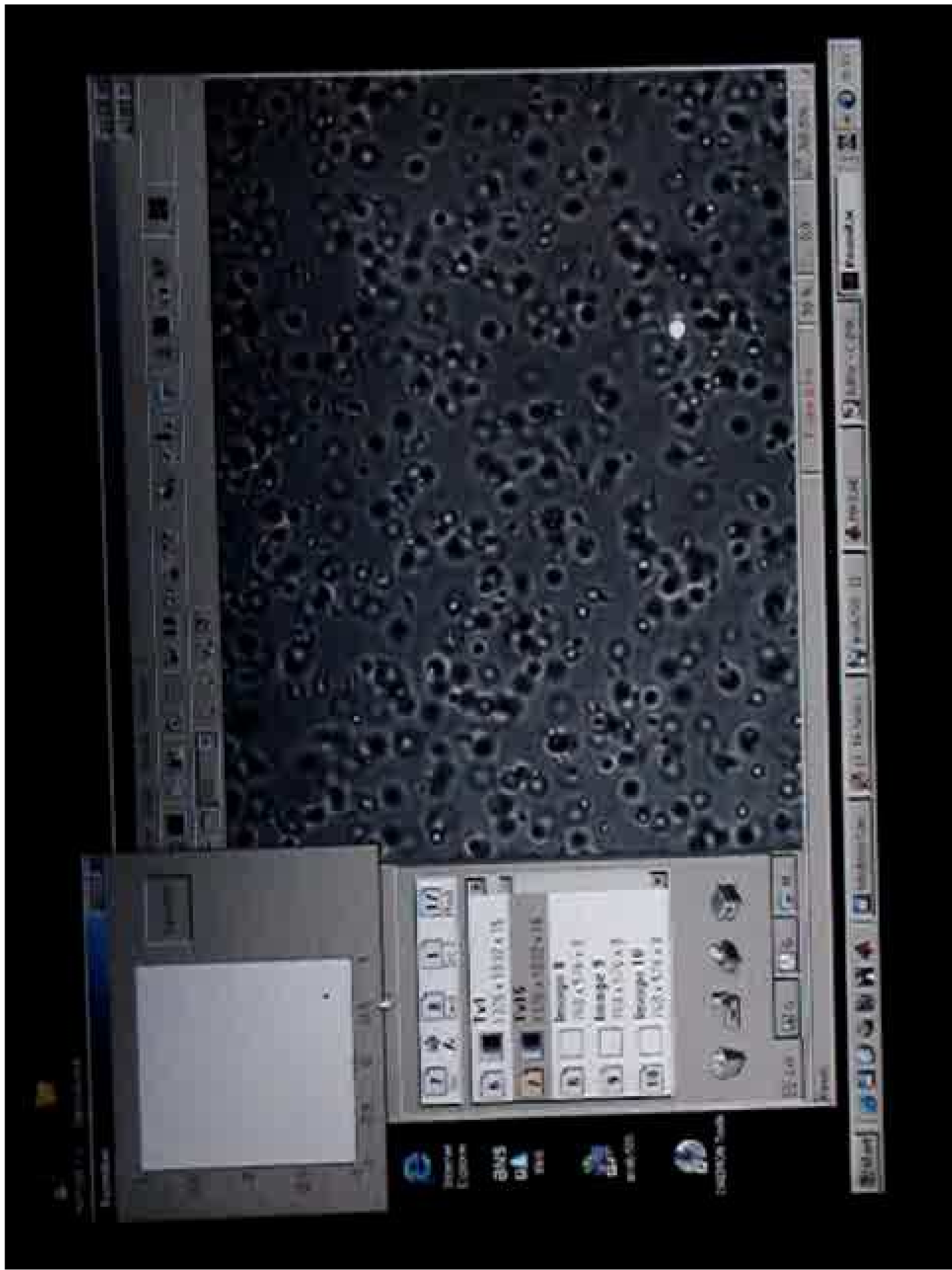
Pracovní oblast rozmítače



Rozmítací setup



$$\frac{f_1}{f_2} = \frac{\tan \tau}{\tan \alpha_{\max}} = \frac{w_0}{w_1}$$



Závěr

- princip činnosti SLM a jeho vlastnosti
- rozmítání laserového svazku pomocí SLM
- účinnost rozmítače
- experimentální ověření

KONEC