Using pico-LCoS SLMs for high speed cell sorting

We propose the use of consumer pico projectors as cost effective spatial light modulators in cell sorting applications. The matched filtering Generalized Phase Contrast (mGPC) beam shaping method is used to produce high intensity optical spots for trapping and catapulting cells. A pico projector's liquid crystal on silicon (LCoS) chip was used as a binary phase spatial light modulator (SLM) wherein correlation target patterns are addressed. Experiments using the binary LCoS phase SLM with a fabricated Pyrex matched filter demonstrate the generation of intense optical spots that can potentially be used for cell sorting. Numerical studies also show mGPC’s robustness to phase aberrations in the LCoS device, and its ability to outperform a top hat beam with the same power.