SHIMURA LAB.

Holographic Memory, Metasurface, and Metahologram

Department of Fundamental Engineering

Department of Applied Physics/Department of Advanced Interdisciplinary Studies, Graduate School of Engineering

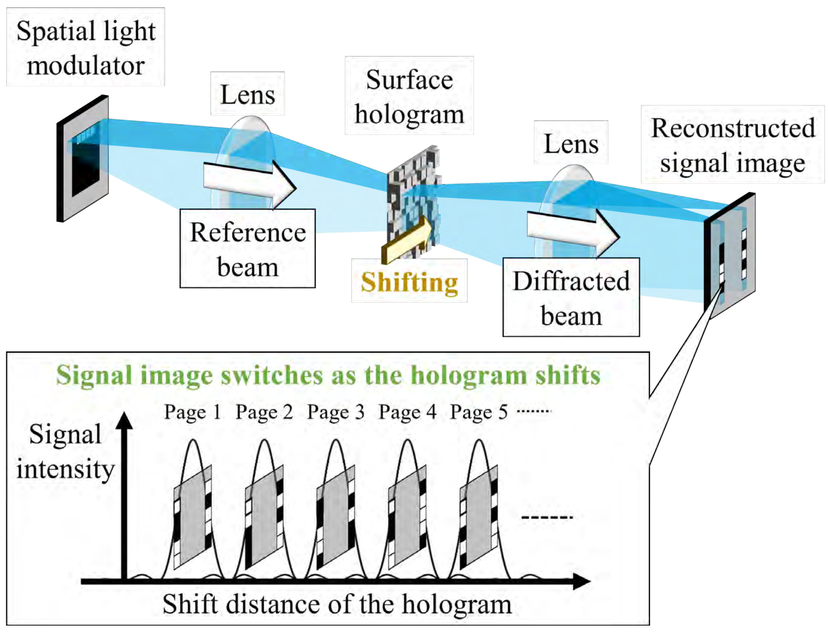
Applied Nonlinear Optics

http://qopt.iis.u-tokyo.ac.jp/

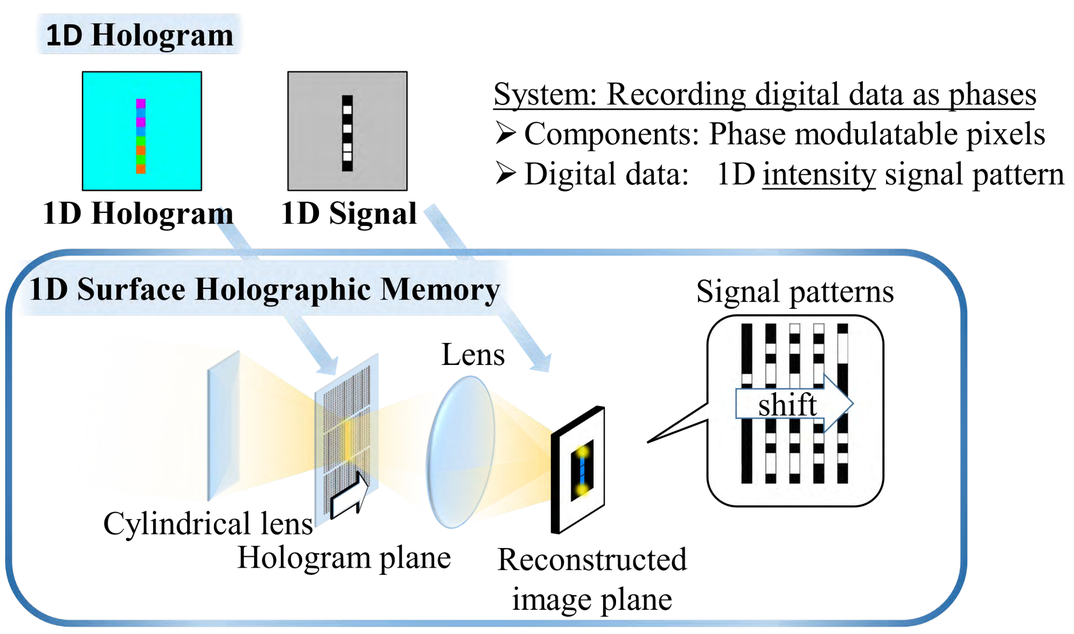
Holographic Memory

Holographic technology allows 3D (volume) recording and parallel access different from conventional optical memory. We aim to develop next-generation holographic memory with a large capacity and an extremely high data transfer rate. Recently, we have been studying a “surface” holographic memory, which has semi-permanent archival life and mass producibility.

■Shift multiplexing surface holographic memory



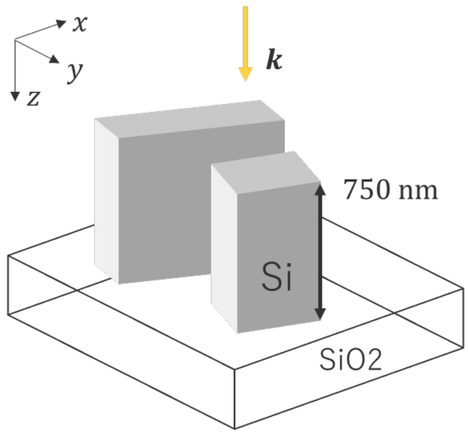
■1D surface holographic memory



Light Wave Control with Metasurface

Metasurfaces are dielectric or metal nanostructures (meta-atoms) arranged on a two-dimensional plane, and the phase, polarization, and amplitude of the incident light wave can be controlled by the shape, size, and spacing of the microstructure. In our laboratory, we are conducting research to explore the principle of light wave control by microstructures and to develop planar optical elements with unconventional functions.

■2-element meta-atom



■Si metasurfaces created by electron beam lithography