NPEM

SHIMURA LAB.

[Optical Systems, Devices, and Materials: Holographic Memory and Nano Plasmonics]

Nanoscience Center for Photonics, Electronics, and Materials Engineering

Applied Nonlinear Optics

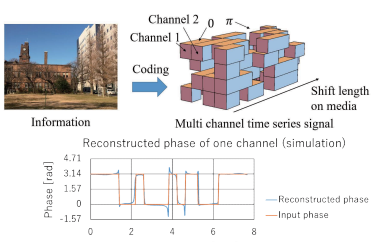
Department of Applied Physics
Department of Advanced Interdisciplinary Studies

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

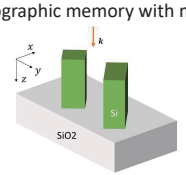
Holographic Memory, Meta-Hologram

Holographic technology allows 3D (volume) recording and parallel access different from conventional optical memory. Our aim is to develop next generation holographic memory with large capacity and extremely high data transfer rate. We are studying following projects in both experimental and numerical modeling approach. We are aiming at realization of ultra-thin optical elements with meta-surfaces.

■Time Sequential Signal Holographic Memory



■Holographic memory with meta-surface

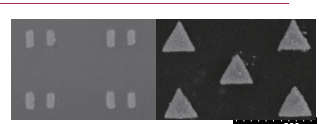


A meta atom of semiconductor nano-structure
Artificial electric and magnetic multipoles control the amplitude, phase, and polarization of the scattered light.
Holographic memories will be realized with the 2D distribution of these meta atoms.

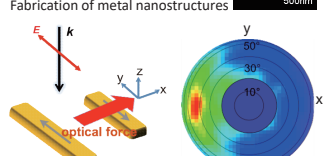
Control of Optical Wave by Nanostructures

We investigate controlling optical properties of nanostructures with tailored plasmonic modes.

Furthermore, we also focus on optical force exerted on nanostructures by the plasmonic control and aim for developing a novel method to manipulate various motions of nanomachines with its plasmonic force.



Fabrication of metal nanostructures



Directional side scattering of light by plasmonic nanostructures