

SHIMURA LAB.

[Holographic Memory and Opto-Magnonics]

Centre for Photonics Electronics Convergence

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

Applied Nonlinear Optics

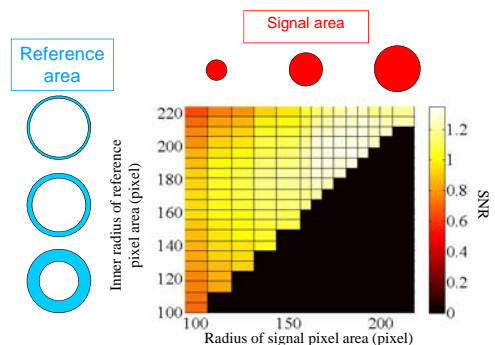
Department of Applied Physics
School of Engineering

Holographic Memory

Next generation optical data storage system

Holographic memory is a candidate for the data storage system for archive storage. It has a potential to achieve the fastest data transfer rate because of massively parallel, page data based writing and reading scheme. At the same time, huge data storage capacity can be achieved because several hundreds of two dimensional digital data pages are recorded as holograms.

In our laboratory, system analysis of the holographic memory and development of high performance the recording materials. Among them, collinear (co-axial) holographic memory is one of our highlights. It has compact and stable optics because of the common path configuration similar to conventional optical discs, such as bluray. We had investigated the theoretical limit of the data storage density in this system. I show that 5 TB/disc is the absolute limit of the storage density in this system.

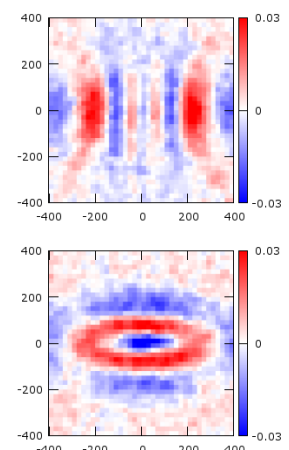


Relation between the pixel arrangement on the SLM and SNR.

Femto-second spin control with light

Development of Optical Magnonics

The frequency of the spin precession in anti-ferromagnetic materials reaches the order of THz, which is much larger than that of the ferromagnetic materials. We are aiming a non-thermal and ultra-fast spin control with femto-second laser pulses. We also doing the research on the spin wave excitation with the femto-second laser pulse and observation of the two-dimensional propagation of the spin wave. We have revealed that the k-vector components of the excited spin wave can be controlled with changing the spot pattern of the excitation pulse on the sample.



Propagation of the spin wave on a ferrimagnetic garnet.