Topics of research results

Yamamoto Lab.

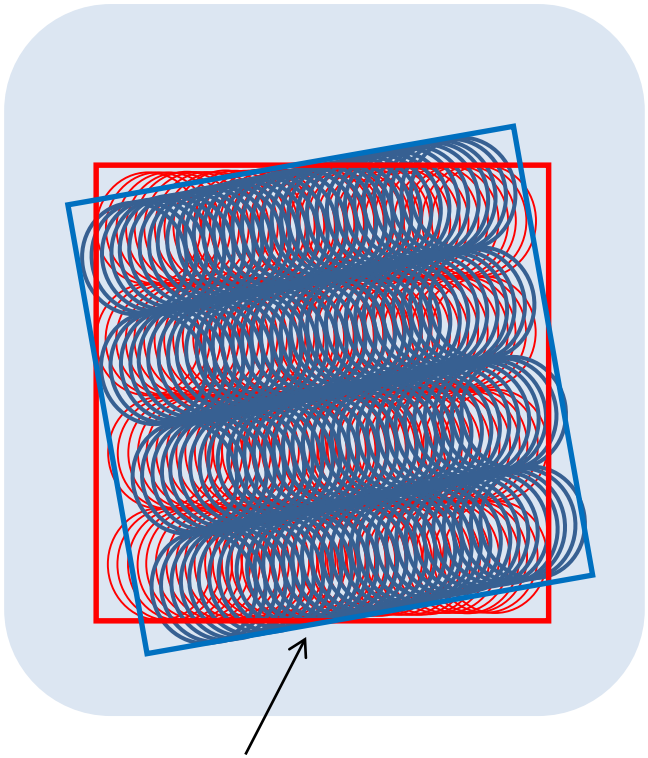
Research and development concept

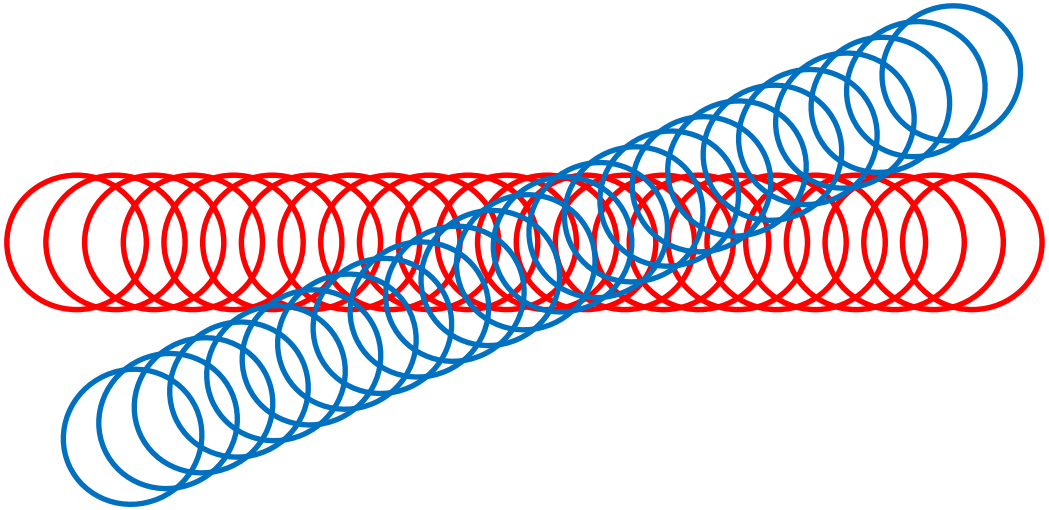
- Power consumption of data center is rapidly increased.
- Along with the electronic data increase, traditional archive, such as official documents, cloud-based archive, and new archive market will increase rapidly.
- Long-term storage is requested ('10 super to 100 years).

- A conventional memory, HDD, a magnetic tape, an optical disk, the SSD may be not suitable for archiving.
- The new memory has to be developed to satisfy power-saving properties, large capacity and low bit cost, long-term storage stability, disaster tolerance at the same time.

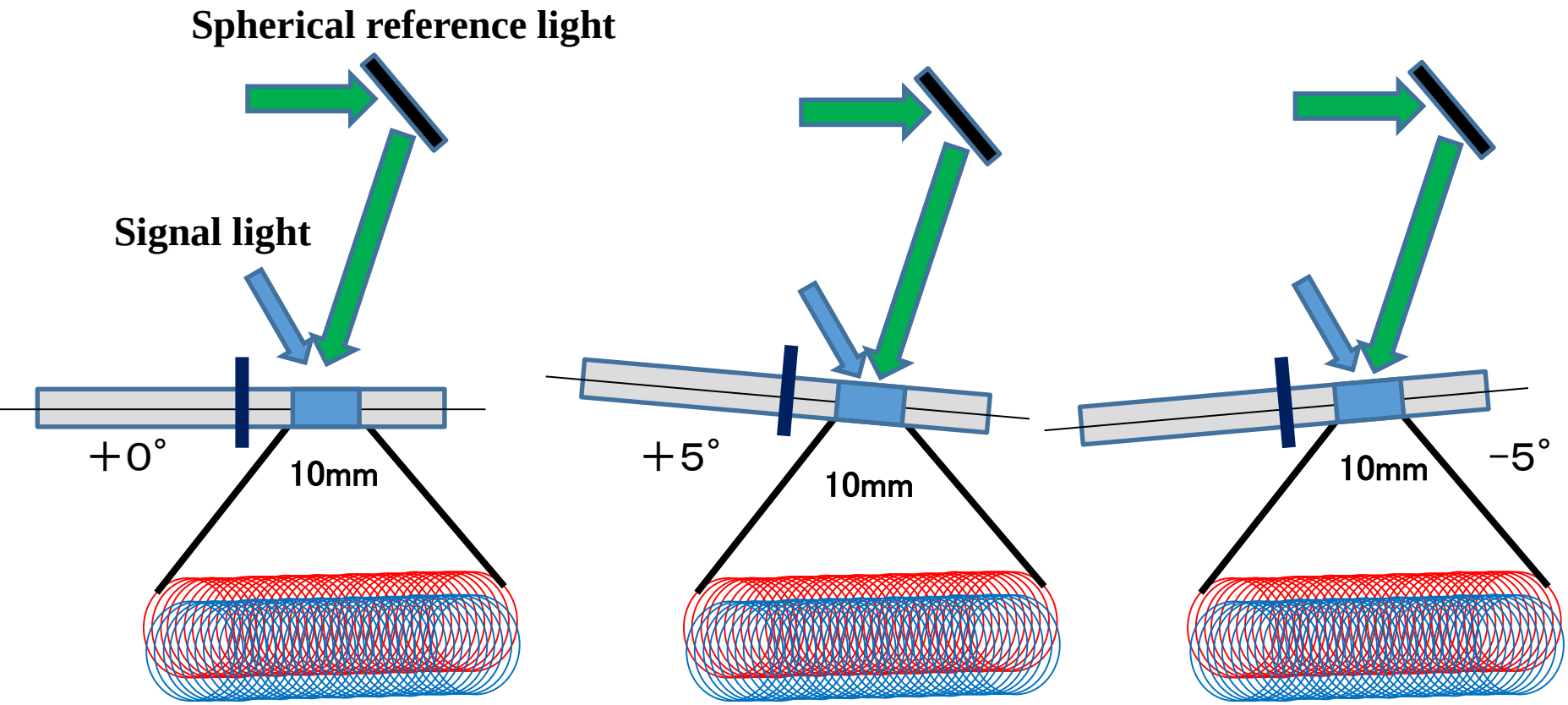
Holographic Data Storage

Cross shift multiplex recording





3D Cross shift multiplex recording



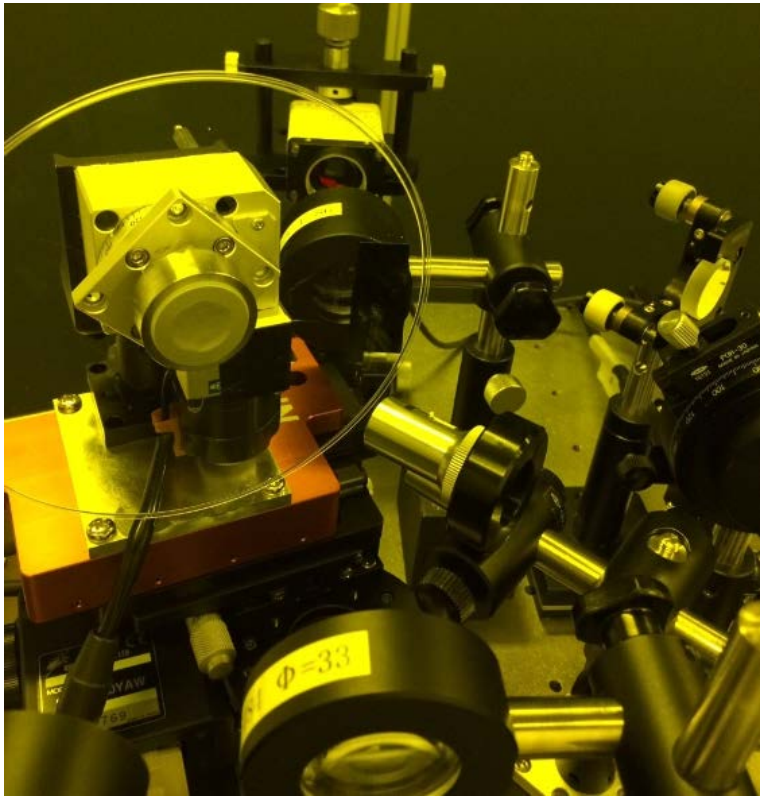
First Shift Multiplexing

Second time

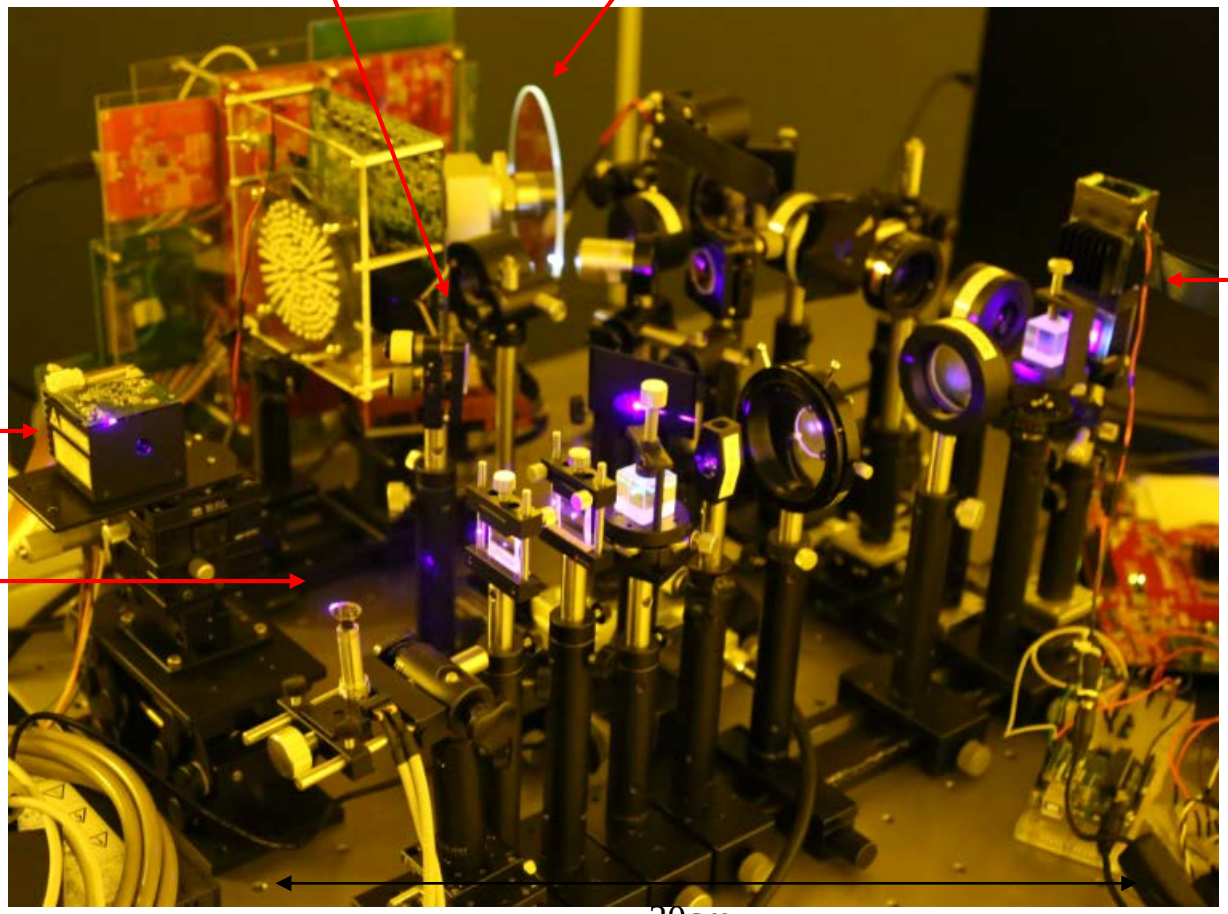
Third time

1 hologram

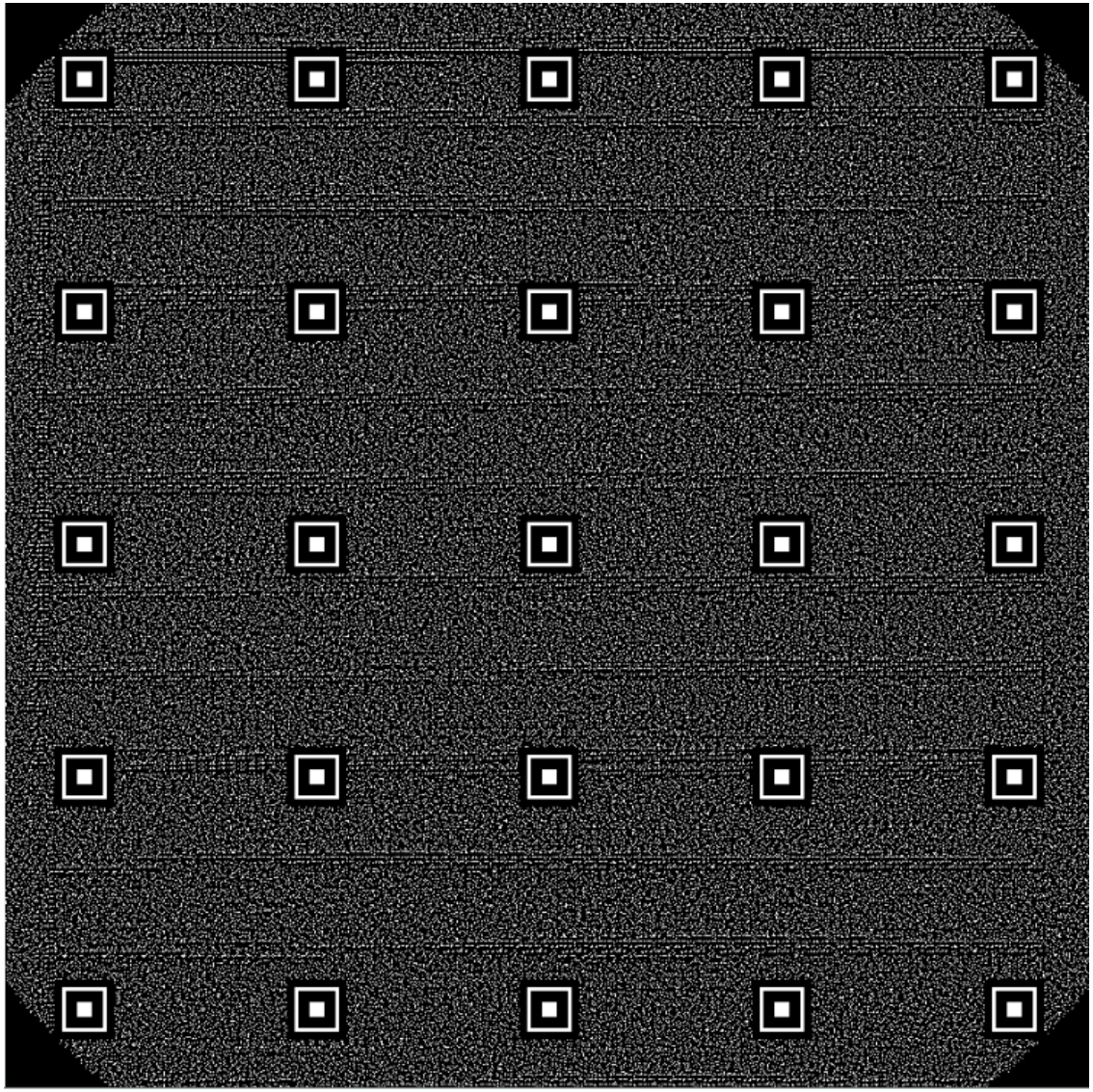
Disk media and peripheral optical system



The configuration of the experimental system

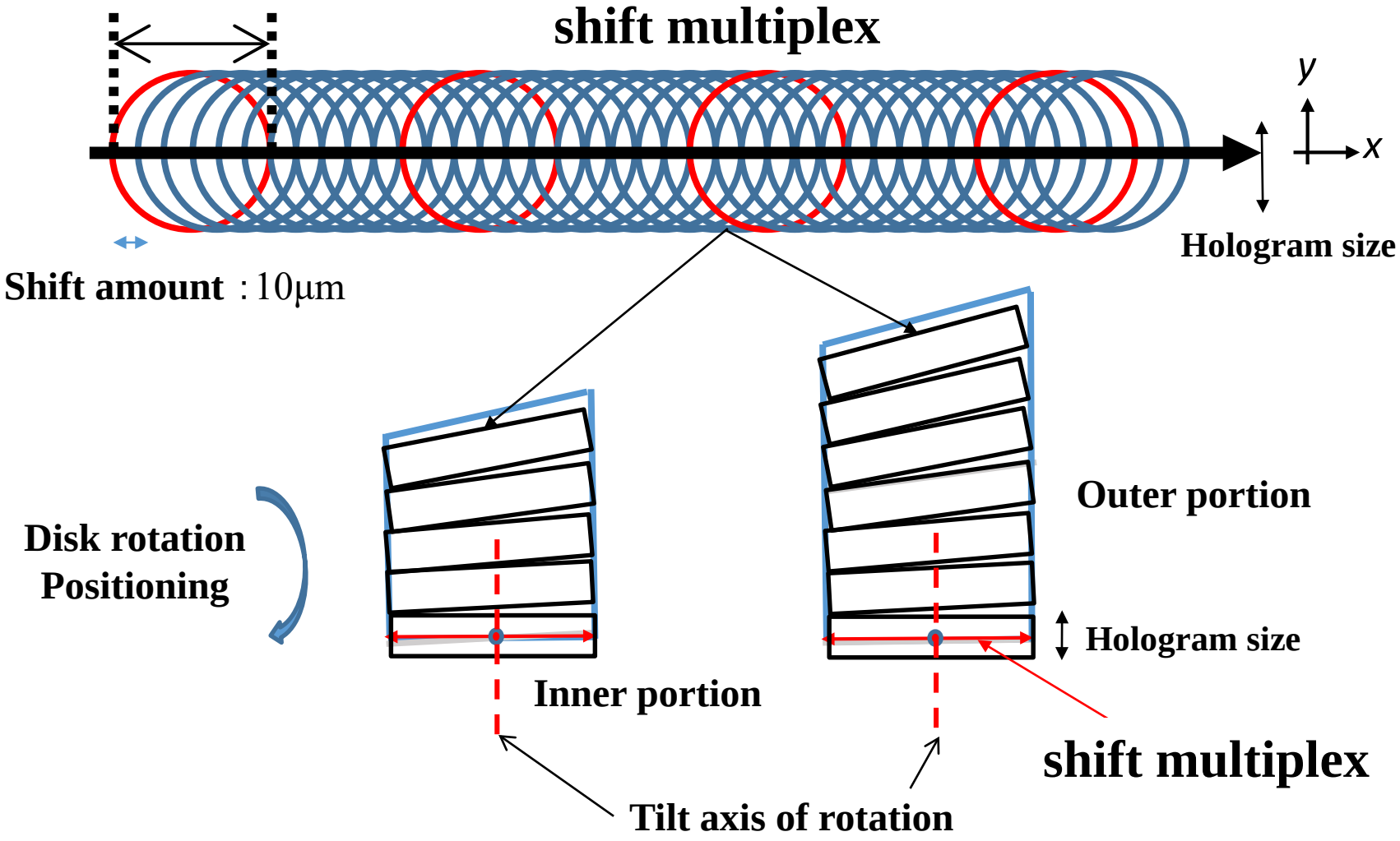


Recording data pattern

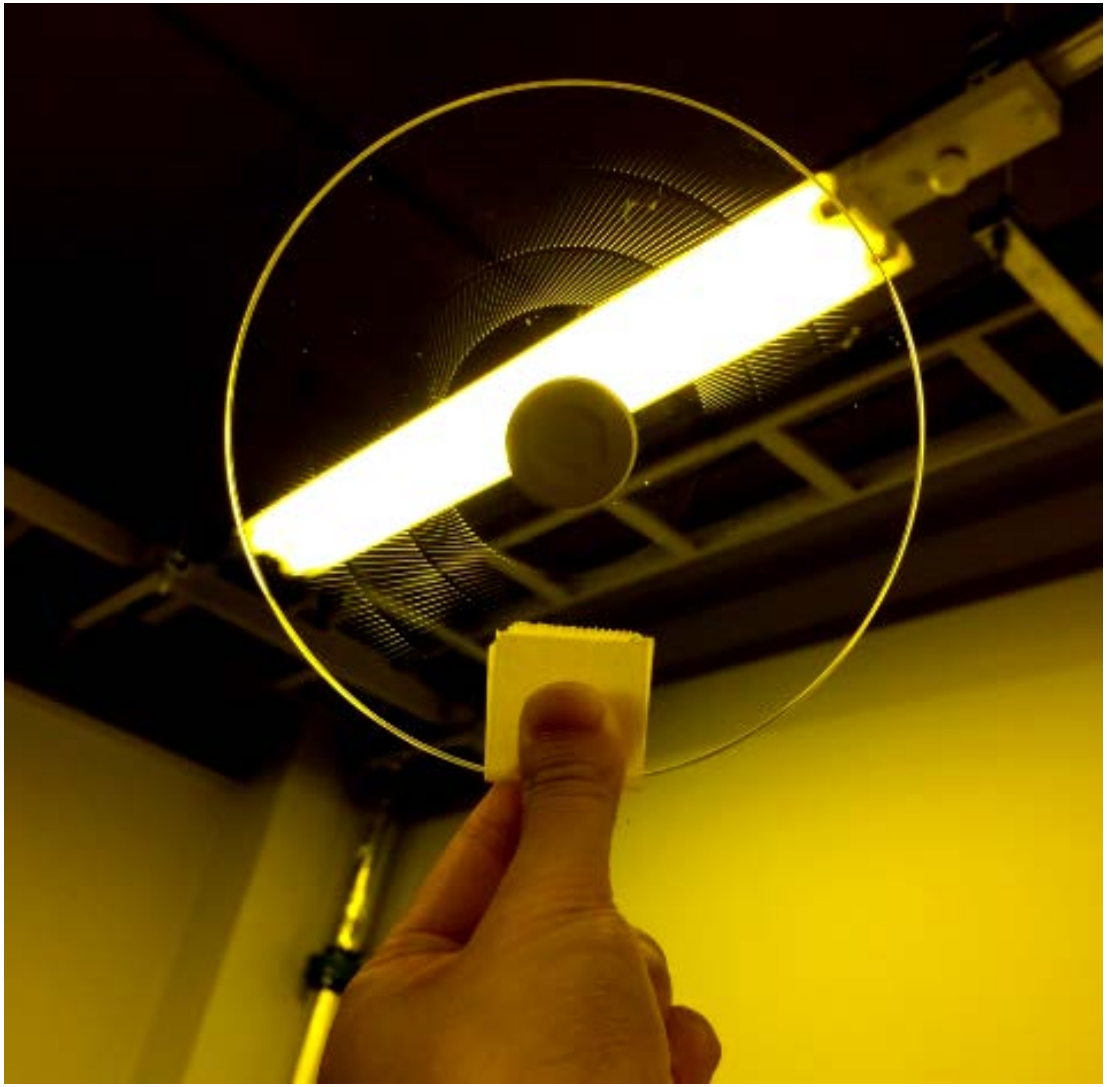


The shift multiplex recording in the disk

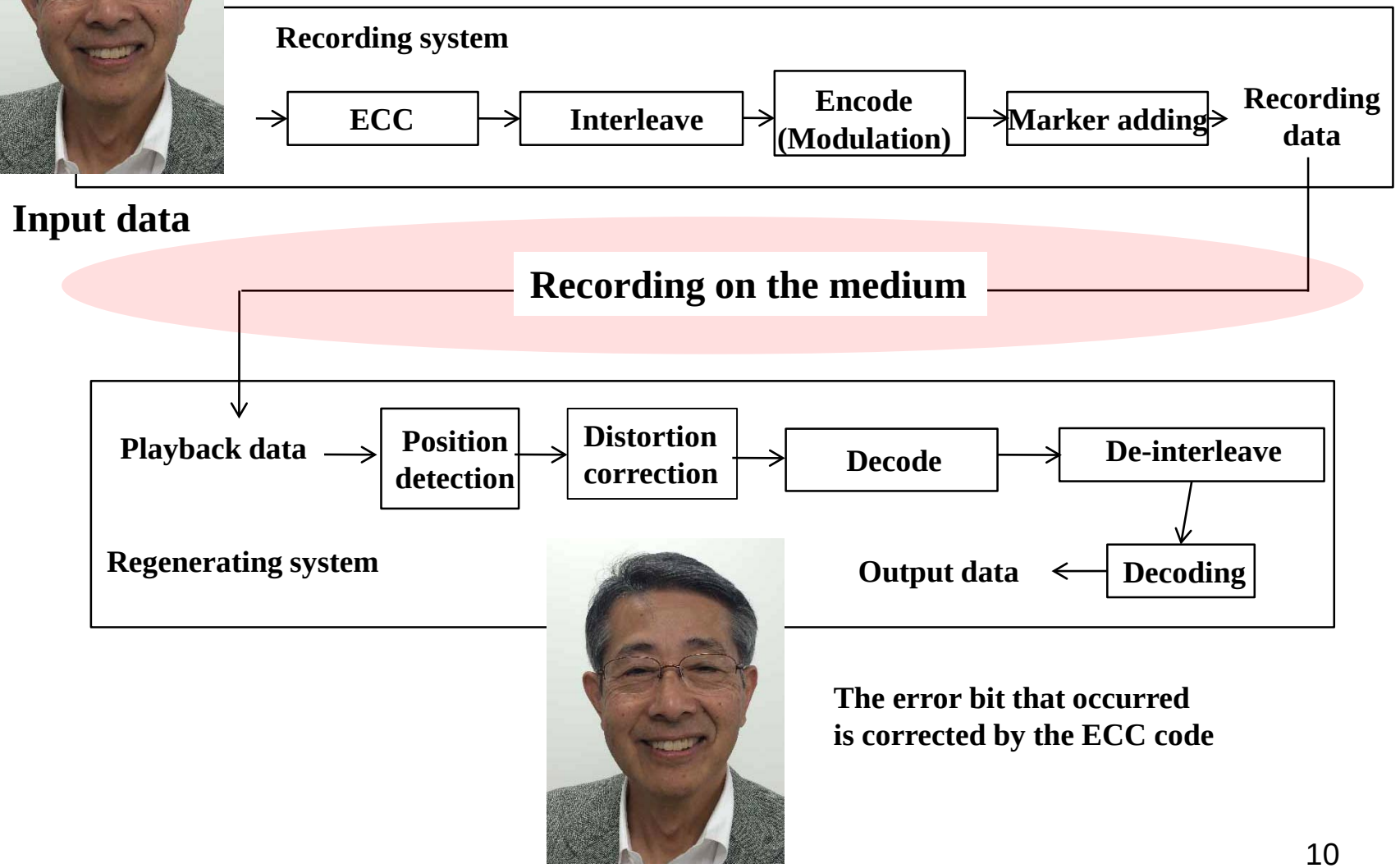
One of the hologram



Recording in the entire surface of the disk

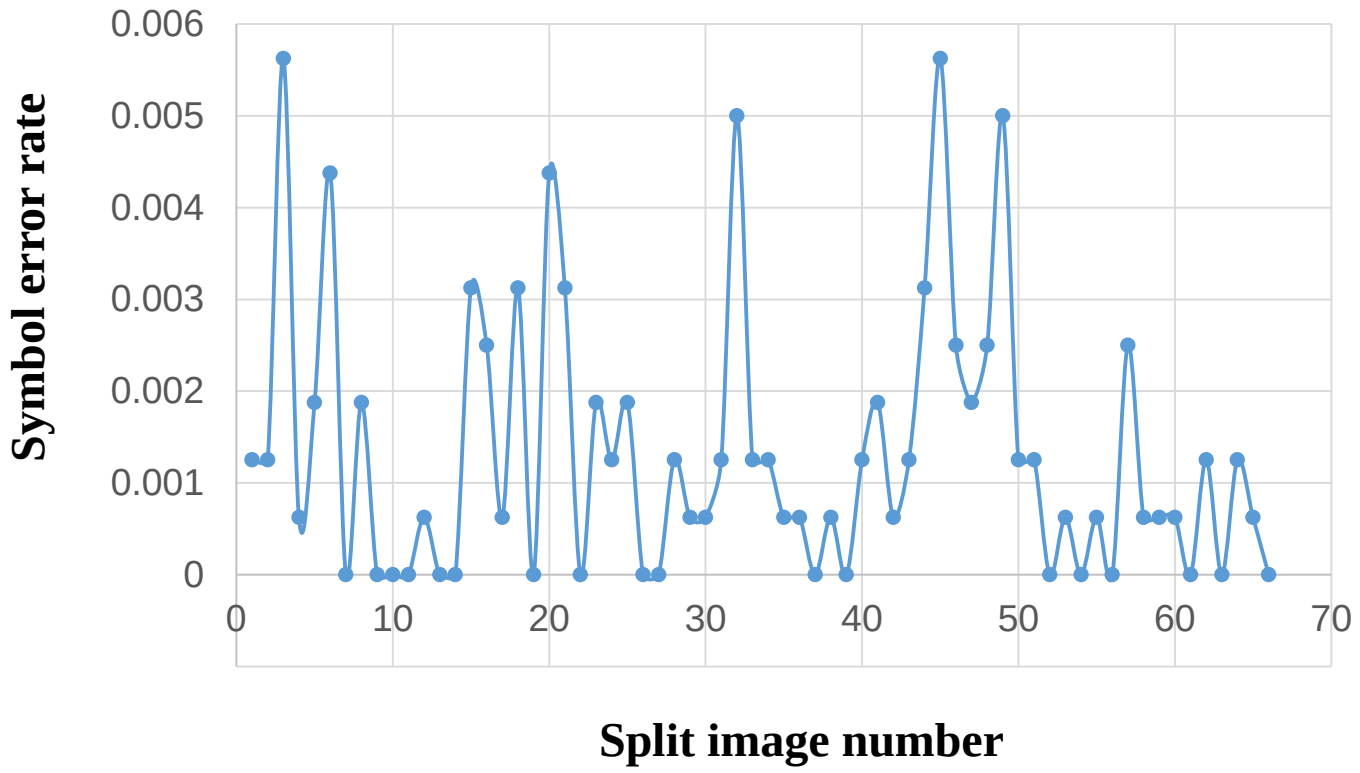


I / O function evaluation results



The error bit that occurred
is corrected by the ECC code

I / O error rate evaluation results



Conclusion and Future Plans

- **Three-dimensional cross-shift multiplexing method is newly invented and developed that enables stable recording and reproduction.**
- **Using long-term reliable photopolymer - disk and a simple optical and mechanical system, full recording of 2 terabyte capacity in one disk can be realized.**
- **Applications : the archive media in the data center and a broadcast station**

We proceed with practical development of this memory system.

We are recruiting companies and the organization that can develop the product system in collaboration.