

Towards practical use of super-resolution readout media

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Abstract

Super-resolution readout that is achieved using a phase-change material is one of the promising techniques for the next-generation high-capacity optical disk media. Ever since it is proposed by Yasuda *et al.* (read-only type) [1] and Tominaga *et al.* (recordable type) [2], many efforts were being made towards its practical use. We, together with our collaborators, did most of the research work on material to be used in the media disk and its film stacking optimization. We would like to make a brief review of the progress with some recent results in this presentation. We found that Sb-Te (e.g., $\text{Sb}_{67}\text{Te}_{33}$) is suitable to do the super-resolution readout, and we intended to make a disk that does not deteriorate when irradiating high-power laser necessary for the readout. We used Pt-O as a write-once recording material since it decomposes only at a high temperature (e.g., 600 °C) [3]. A Ge-N layer was inserted between Sb-Te and ZnS-SiO₂ layers to prevent diffusion of the two layers [4]. These approaches on optimization made it possible to continue the super-resolution readout for more than 2×10^5 times [4]. It is thus now more promising to use the super-resolution readout technique for the practical use.

Reference

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- [2] J. Tominaga *et al.*, Appl. Phys. Lett. 73 (1998) 2078.
- [3] T. Kikukawa *et al.*, Appl. Phys. Lett. 81 (2002) 4697.
- [4] T. Shima *et al.*, Jpn. J. Appl. Phys. 46 (2007) L135.