Milestone reached for hard drive storage

Seagate Technology, involved in the EC projects ULTRAMAGNETRON and FEMTOSPIN has doubled the storage capacity of today's hard drives with the Heat Assisted Magnetic Recording (HAMR) technology supported in these projects.

Mark Re, Senior Vice President at Seagate Technology

Mark Re, Senior Vice President at Seagate Technology said: 'Seagate is pleased to be involved in the EC projects Ultramagnetron and FEMTOSPIN, which have contributed important basic knowledge to the understanding of HAMR processes. As a forward-looking company Seagate is especially interested in the all-optical recording technology under investigation within Ultramagnetron and FEMTOSPIN, which have the potential to take magnetic recording even beyond HAMR.'

In HAMR a laser is used to heat the medium to a sufficiently high temperature to assure writability using currently available write head fields. Seagate achieved the 1 terabit per square inch demonstration with breakthroughs in materials science and near-field optics. The materials investigated are ferrimagnetic rare earth-transition metal alloys (like GdFeCo) but also ferromagnetic system like FePt to demonstrate that reversal is not (solely) related to the special properties of ferrimagnets, or rare earth systems.

The next challenge is to study antiferromagnetic materials from the point of view of their intrinsic ultrafast (THz) dynamics exhibited by the exchange spin-wave modes. The effects of nanostructuring and of layered and/or multi-component magnetic materials such as FePt, FeNi, and GdFeCo will also be investigated, with the ultimate aim of removing the write field in order to simplify the system design and manufacture and to reduce the energy required to store individual bits.

The ultimate recording system consisting of magnetic islands, each representing a bit of information, reversing under the heating effect of a laser beam (courtesy Dr R Evans)

References:
Nature, 472, 205 (2011);
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