News

# Sound waves used to increase disk drive capacity

Ultrasound technique could also be used on solid-state storage

By Lucas Mearian
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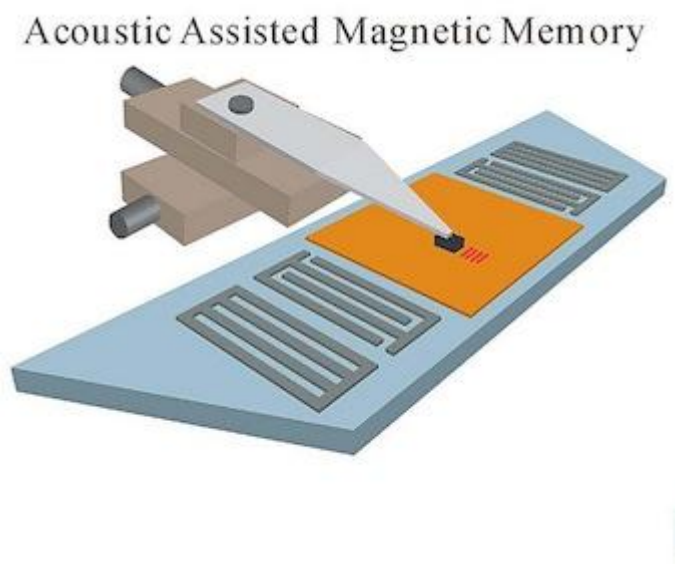
Computerworld - Researchers at Oregon State University (OSU) said today that they have found a way to use high-frequency sound waves to improve magnetic data storage techniques.
The breakthrough could allow greater amounts of data to be stored on both hard disk drives and NAND flash-based solid-state drives (SSDs).

"We're near the peak of what we can do with the technology we now use for magnetic storage," said Pallavi Dhagat, an associate professor in the OSU School of Electrical Engineering and Computer Science. "There's always a need for approaches that could store even more information in a smaller space, cost less and use less power."

The technology is called acoustic-assisted magnetic recording, according to the electrical engineers who discovered it. They presented their results at the 12th Joint MMM/Intermag Conference in Chicago this week. The researchers have filed a U.S. patent application as well.




A depiction of acoustic-assisted magnetic recording (Image: OSU)

When magnetic recording materials are temporarily heated, even for an instant, they can become momentarily less stiff and more data can be stored at a particular spot, according to the researchers.

But, the technique has proven difficult to effectively increase capacity because the heating tends to spread beyond where it is wanted and the technology involves complex integration of optics, electronics and magnetics, the researchers said.

With acoustic-assisted magnetic recording, ultrasound is directed at a highly specific location on the platter while data is being stored, creating elasticity that allows "a tiny portion of the material to bend or stretch."

After the ultrasound is turned off, the material immediately returns to its original shape, but the data stored during the process remains in a dense form.

The researchers did not say by how much the density data storage could be increased through the ultrasound technique.

While as yet untested, the researches said ultrasound should also have the same effect on solid-state memory used to make SSDs.

"This technology should allow us to marry the benefits of solid state electronics with magnetic recording, and create non-volatile memory systems that store more data in less space, using less power," said Albrecht Jander, also an associate professor of electrical engineering and collaborator on the research.

This approach might work with materials already being used in magnetic recordings, or variations of them, the researchers said. Researchers will continue to explore performance, materials and cost issues.

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