

Abstract Submitted
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Carbon nano-fuses for permanent data storage KEVIN LAUGHLIN,

None — In today's world, just about everything is in digital form. This includes things like pictures of family and friends, ancestral work, music, movies, and much more. Unfortunately, the way to store data has typically been put it on a hard drive, thumb drive, or CD. What many people don't know is that these ways of data storage can only hold data reliably for about 7 years. The goal of permanent data storage is that the data gets written once and it will always be there when you need it. We have been working on a solid-state solution to this problem. The permanent data storage devices are an array of nano-fuses that are made of a thin carbon film that is 20-40nm thick, and varying from 250-1000nm wide. The carbon pads were created using an electron beam lithography technique to etch out the pattern, and carbon was then evaporated onto the device. Voltages above 6 volts were then pulsed or ramped across these fuses, oxidizing the carbon and causing a break in the fuse. Memory elements consist of a nano-fuse, and breaking a fuse will change the bit from a 1 to a 0. After the fuses were broken, they were analyzed with an SEM and an AFM. It has been found that these carbon nano-fuses are a good possibility for the future solid-state permanent data storage devices.

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None

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