

## **New Device for 100 Tera-bit per inch square information storage**

A research organization has devised magnetic graphene-ribbon as a candidate for realizing future ultra high density 100 tera bit/inch<sup>2</sup> class data storage media. Multiple spin state analysis was done based on the density function theory. A typical model was a super cell [C<sub>80</sub>H<sub>7</sub>] which having bare (radical) carbons on one side zigzag edge, whereas mono hydrogenated on another side. Optimizing atomic configuration, self consistent calculation demonstrated that a total energy of the highest spin state is more stable than that of lower one, which came from exchange coupling between carbons. This analysis suggested a capability of designing magnetic data track utilizing such chemically edge modified graphene ribbon. In order to increase areal magnetization density, bilayer and quadri-layer graphene-ribbon model were analyzed. Detailed calculation resulted that also the highest spin state is the most stable one. Multiplying the layer numbers is effective way to realize and enhance strong magnetism.

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