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Positioning devices based on submicro-textured magnetostrictive alloys ($\mathbf{Fe_{85}Ga_{15}}$)[1] GAMAGE DANNANGODA, KAREN MARTIROSYAN, University of Texas at Brownsville — Magnetostrictive materials can convert magnetic energy into kinetic energy. Under the influence of an external magnetic field, the rotation of small magnetic domains causes a change in a magnetostrictive materials shape in the direction of the magnetic field. Applying stronger magnetic field will tend to rotate more domains and makes the material to stretch even more until it reaches its saturation. This property has been used in many applications such as micro acoustic sensors, generators, marine sonar, devices, linear motors, robust actuators, automotive accessories, positioning devices etc. There is increasing interest in magnetostrictive applications after discovering the giant magnetostrictive alloys such as Galfenol and Terfenol-D which is capable of generating strains 100 times greater than traditional magnetostrictive materials at high temperatures. Even though Galfenol doesn't produce as much as magnetostriction as Terfenol-D, it can be constructed mechanically strong with tensile strengths up to 500 MPa and can be rolled, extruded, and welded. The magnetostrictive positioning devices based on submicro-textured magnetostrictive alloys ($Fe_{85}Ga_{15}$) and their advantages will be discussed.

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