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Effect of nanostructuring in $\text{Mn}_2\text{Ni}_{1+x}\text{Ga}_{1-x}$ magnetic intermetallic system SUTAPA BISWAS, MAHMUD KHAN, TIAGO SCHAEFFER, Miami University — The exchange bias effect (EB) is a phenomenon, which is signified by a shift of the magnetic hysteresis loop along the magnetic field axis. A group of Mn-rich Heusler alloys also exhibit exchange bias properties. EB effects in these alloys are observed while they are in their polycrystalline bulk form. The EB effect in Heusler alloys is also attributed to the coexisting ferromagnetic (FM) and antiferromagnetic (AFM) interactions. Mn_2NiGa is a Heusler alloy where the Mn moments show both parallel and anti-parallel alignments. The material does not exhibit any EB effect. Here, we have systematically investigated the magnetic and EB properties of $\text{Mn}_2\text{Ni}_{1+x}\text{Ga}_{1-x}$ ($0 \leq x \leq 0.60$). As x exceeded 0.2, EB started to appear in the system. EB-field as large as 4000 Oe was observed in this system of material. The samples were fabricated by arc melting and annealing techniques. Nanostructured ribbons were prepared for selected compositions by melt spinning technique. The effect of annealing temperature on the EB properties of the ribbons comparing to the bulk material properties will be discussed and presented.

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