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Abstract of the Disclosure

A magnetic recording system uses an improved spin valve magnetoresistive (SVMR) sensor. The SVMR sensor has a self-pinned laminated layer as the pinned ferromagnetic layer in place of the conventional single-layer pinned layer. Because this laminated layer is "self-pinned", a hard bias or exchange bias layer is not needed. The self-pinned laminated layer has at least two ferromagnetic films antiferromagnetically coupled to one another across a thin antiferromagnetically (AF) coupling film. Since the two ferromagnetic films in this laminated layer have their magnetic moments aligned antiparallel, their two magnetic moments can be made to essentially cancel by making the two ferromagnetic films of substantially the same thickness. The magnetic field energy generated by the signal field acting on this laminated layer will be significantly less than the effective anisotropy energy of the laminated layer. This is because the former is proportional to the difference in thicknesses of the two ferromagnetic films in the laminated layer, while the latter is proportional to the sum of the thicknesses. As a result, the laminated layer will not rotate in the presence of the signal field, but will be "self-pinned". The elimination of the exchange bias layer previously required for pinning also eliminates the need for Ni-Mn and its associated high-temperature process.

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