

Magnetic Properties of Fe/FeCo/Cu(001) and Fe/FeCo/Co/Cu(001) Films

Dongyoo Kim*, Hashmi Arqum, Jisang Hong
Department of Physics, Pukyong National University

Using the full potential linearized augmented plane wave (FLAPW) method, we have investigated the thickness dependence magnetic properties of Fe/FeCo/Cu(001) and Fe/FeCo/Co/Cu(001) films. We have observed that magnetic moment of Fe atoms located at FeCo alloy layer show different value with two types of structure. For instance, magnetic moment of Fe atom at FeCo alloy layer have been enhanced in Fe/FeCo/Cu(001), but suppressed magnetic moments are observed in Fe/FeCo/Co/Cu(001) structure. This means that the interaction between nearest atoms is the most important factor in the essential magnetic interaction. Also, we have calculated Fe thickness dependent magnetocrystalline anisotropy energy (MCA). In Fe/FeCo/Cu(001) structure, spin reorientation transition (SRT) phenomenon is obtained with increasing Fe thickness. In Fe/FeCo/Co/Cu(001) structure, all of structures show perpendicular magnetization with surface, and the value of MCA is decreased by increasing Fe thickness.