

Flux Flow Resistance Depending on Different Magnetization-easy-axis Directions in Py/Nb/ Py Trilayers

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The magneto-resistance and superconducting transition temperature of Py/Nb/Py trilayers with different magnetization easy-axis directions to the current direction have been measured with current flow in the layer plane. We discuss flux flow element in magneto-resistance which would be occurred by stray fields from the F layers. We also prepared a large trilayers sample which is identically the same structure with the patterned samples and identified the stray field from the magnetic layers during magnetization reversal. Above the superconducting transition temperature of Nb, the magneto-resistance shows a standard behavior of anisotropic magneto-resistance and that due to domain wall effects. In the middle of superconducting transition temperature region, inverse magneto-resistance behavior were observed in every sample except of 72 degree sample. The magneto-resistance of 72 degree sample showed a decrease of the resistance when the magnetic layers are antiparallel in the resistance tail region of superconducting transition. We try to explain the difference of magneto-resistance at the trilayers as flux flow resistance and proximity effect

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