

Giant magnetoresistance in granular cobalt copper thin films prepared by pulsed laser ablation deposition

ABSTRACT

Giant magnetoresistance of up to 9.5% in 1.5 T at 14 K has been observed in Co₁₉Cu₈₁, thin films prepared by pulsed laser ablation deposition from rotated, split targets. The as-grown films show a small GMR effect but this may be enhanced by a factor of 4 by appropriate annealing. The volume ratio of material in the target is found to be reproduced in the film. Measurements of the remanence and initial susceptibility of the films indicate a distribution of energy barriers to the rotation of the magnetic moments of the cobalt particles and also the presence of inter-particle interactions. The choice of operating parameters to control these effects and thus optimise the GMR is discussed.

Keyword: Giant magnetoresistance; Pulsed laser ablation deposition