Exchange bias in oxygen-implanted Co/Au thin film heterostructures

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Magnetic systems exhibiting exchange bias effect are being considered as functional parts of modern data storage devices. A model system for the investigation of this effect is an antiferromagnetic-ferromagnetic CoO/Co interface. In this paper we present the studies of magnetic properties of Co-CoO/Au multilayers where the cobalt oxide was formed by oxygen ion beam implantation. Special emphasis is given to the role of the oxygen concentration profile in the magnetic properties. By properly designed the implantation conditions (ion beam energy and fluence) it is possible to fabricate a system revealing controlled stepwise magnetization reversal process. This underlines the great potential of this approach to tailor the magnetic properties through modification of implantation profiles.

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