METHOD OF MAGNETICALLY PATTERNING A THIN FILM BY MASK-CONTROLLED LOCAL PHASE TRANSITION G

Abstract of the Disclosure

A method of producing a patterned magnetic nanostructure is disclosed. The method includes providing a substrate having a non-magnetic single layer or multi layer film that can be converted into a magnetic state by annealing and/or mixing. The method further includes positioning a mask having a desired pattern and resolution associated with the patterned magnetic nanostructure on or over the film. The method additionally includes subjecting the mask-covered substrate to a beam of radiation (focussed or unfocussed) having sufficient energy to locally anneal and/or mix the non-magnetic or weak-magnetic single-layer or multi layer film. Because of the mask effect, only the desired portions of the non-magnetic film are exposed to the beam of radiation. As such, the desired portions of the non-magnetic film are changed from a non-magnetic to a magnetic state to produce an array of magnetic elements in a non-magnetic matrix. The size of each magnetic element is dependent on the resolution of mask.

(Figures 1 and 2)