Surface roughness and magnetic relaxation in electrodeposited systems.

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We shall present two sets of experimental data from electrodeposited films and nanostructures.

Firstly, we show how the surface roughness of electrodeposited amorphous CoP varies as a function of the film thickness for growth on smooth Au and rougher Cu substrates. These films are of interest for their soft magnetic properties. Roughness measurements were made by atomic force microscopy. Unusually, the roughness actually *decreases* for thicker CoP films. Also, the characteristic lateral feature size remains approximately constant for a range of thicknesses covering several μm. Possible reasons for this behaviour will be discussed.

Secondly, we present thermal relaxation data for electrodeposited Ni(Cu)/Cu multilayered nanowires deposited in nanoporous track-etched polycarbonate membranes from a single electrolyte. These multilayers contain Ni-rich islands with a magnetization that decays on removal of a saturating field as a result of thermal activation. The temperature dependence of the measured relaxation rate provides information on the distribution of energy barriers in the system. This may be affected by interactions, as well as by the shape anisotropy of the islands.