

# Exchange coupling effects in naturally oxidised ultrathin iron films

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Oxidation process of Fe films under atmospheric conditions is depth limited such that an oxide covering layer with a well-defined thickness is formed by which the underlying metal is prevented from further oxidation. Iron thin films were deposited onto 1.6 nm – V(110) buffer layer using UHV magnetron sputtering. The chemical compositions of natural Fe oxides were studied by X-ray and ultraviolet photoelectron spectroscopy. The planar growth of Fe oxides was revealed by atomic force microscopy. Furthermore, magnetic measurements of Fe films with an initial thickness lower than 5 nm revealed an exchange anisotropy which is imposed to the metallic rest. As a result, we have observed a shift and broadening of the hysteresis loops due to the exchange interaction at the metal – oxide interface. The blocking temperature increases with time reaching 260 K after 650 days of oxidation.