Long magnetic lifetime of Dy adatoms on zinc oxide

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A review of the physics behind single atom magnetism will be done to better understand our system. Dy atoms are deposited on a ZnO surface that has been grown on Au(111). Most of the STM work on this system will be done on 2 ML films, recognized from the other thicknesses by their characteristic image potential states. Since zinc oxide is known for its piezoelectricity, the achievability to control the magnetic properties of single-atom magnets by modifying the crystal field with electric field will be briefly discussed. We will show that experimental measurements from XMCD and SP-STM reveal the existence of stable magnetic moments for Dy adatoms on the zinc oxide surface. The magnetic lifetimes measured using SP-STM will prove to be exceptionally long at high tip-sample bias, pushing the limits of the similar investigations done on Ho/MgO and Dy/MgO (1-3).

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