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Growth of EuO films on Si using Pulsed Laser Deposition[1] VIVEK S. JAIN, GAURAB RIMAL, JINKE TANG, Department of Physics Astronomy, University of Wyoming — Epitaxial monolayers of europium monoxide (EuO) deposited on silicon (Si) wafers are suited for spintronic applications such as adding spin filter tunneling and spin current to Si technology, and for probing phenomena like Anomalous Hall effect and Topological Hall effect. However, the innate chemical reactivity of europium (Eu) and Si prevents a direct synthesis of EuO by pulsed laser deposition technique, without significant contamination of the EuO/Si interface and degradation of the EuO thin film. Silicon oxides ($SiO_{2-\delta}$) on the surface of Si substrates, partial pressure of oxygen (O_2) gas and water vapors in the vacuum chamber act as contaminants. Techniques like standard wet etching process, thermal annealing, and decomposition of $SiO_{2-\delta}$ by the bombardment of metal ions, and their effectiveness is studied using the X-Ray diffraction (XRD) system. Our goal is one-process in situ integration of spin-functional magnetic oxides seamless on Si wafers. Also the mechanism for the ferromagnetic order in oxygen-deficient europium monoxide (EuO_{1-x}) at temperatures higher than 69K (the Curie temperature of stoichiometric EuO) remains controversial. We have investigated the magnetization of EuO_{1-x} thin films prepared via PLD as a function of (emu) vs (K)

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