Magnetic properties of atomic layer deposited oxide thin films

Kristjan Kalam[1]

[1]Institute of Physics, University of Tartu, W. Ostwald 1, 50411 Tartu, Estonia. E-mail: kalam@ut.ee

Magnetic thin films can be a component in a wide range of technological applications, from data storage and spintronics to biomedical devices. Atomic layer deposition (ALD) is a prominent method for thin film fabrication because of its thickness control capability and conformality. We will discuss the ALD method, its advantages and shortcomings, characterization methods of such films, and describe their magnetic properties. For example, ZrO_2-Co_3O_4 [1], ZrO_2-HfO_2 [2] and HfO_2-Fe_2O_3 [3] nanolaminated structures have been shown to exhibit ferromagnetic-like behavior.

1. Kalam, Kristjan, et al. "Electrical and magnetic properties of atomic layer deposited cobalt oxide and zirconium oxide nanolaminates." *Thin Solid Films* 669 (2019): 294-300.
2. Kalam, Kristjan, et al. "Electric and magnetic properties of atomic layer deposited ZrO2-HfO2 thin films." *ECS Journal of Solid State Science and Technology* 7.9 (2018): N117.
3. Kalam, Kristjan, et al. "Memory effects in nanolaminates of hafnium and iron oxide films structured by atomic layer deposition." *Nanomaterials* 12.15 (2022): 2593.