

# Electric field induced dynamic magnetization switching in FeCo ultrathin films at room temperature

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Magnetization control using an electric field [1] will be useful because of its expected ultra-low power consumption and coherent behaviour. Several experimental approaches to realize it have been done using ferromagnetic semiconductors [2], materials with magnetostriction together with piezo-driver [3], multiferroic materials [4], ferromagnetic metal films sintered in an electroride [5], and an ultra-thin ferromagnetic layer[6].

One of the critical issues in the electric field switching is a realization of bi-stable switching. Since the electric field does not break time reversal symmetry, it does not remove degeneracy of two magnetic states with opposite magnetization. Therefore, a selection of an arbitral magnetic state is not straightforward [7]. Here, we demonstrate a realization of the bi-stable switching using a coherent precessional magnetization toggle switching in nanoscale magnetic cells with a few atomic FeCo (001) epitaxial layers adjacent to MgO barrier [8].

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