24th International Young Scientists Conference Optics and High Technology Material Science - SPO 2023 "STAND WITH UKRAINE"

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Multiferroics: controlling magnetism with electric fields

Friday, 17 November 2023 10:40 (30 minutes)

Multiferroic materials, which exhibit multiple ferroic orders simultaneously, have garnered significant scientific interest thanks to their potential for electric-field control of magnetism. These materials present unique domain formations and poling behavior under external fields. Here, we will showcase a remarkable reversible transfer of domain patterns between magnetization and electric-polarization spaces in $Dy_{0.7}Tb_{0.3}FeO_3$ (DTFO) – the ideal multiferroic material. A magnetic field can impress a ferromagnetic domain pattern onto an identical ferroelectric domain pattern, effectively erasing the original magnetic domain. The process can be reversed, completing a cycle of domain transfer. This attribute of DTFO extends our understanding of domain coupling in multiferroics and opens up new possibilities for their application. Ref.: Hassanpour.... Weber, Science 377, 1109–1112 (2022)

Topics

Session A. Physics of condensed matter and spectroscopy

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Presenter: Dr WEBER, Mads C. (Le Mans University / Institute of Materials and Molecules Le Mans) **Session Classification:** Multiferroics and Magnetoelectric Coupling