

Solids4Fun

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Magnetoelectric coupling and dynamics of topological defects in Mott insulators

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Multiferroic materials with their coexisting orders of electric and magnetic dipoles may find many technological applications, such as magnetoelectric random access memory, that excel by their low power consumption. Recent progress in the field of multiferroics led to discovery of many new compounds and spectacular magnetoelectric effects, e.g. the magnetically-induced rotation of electric polarization, the giant increase of dielectric constant in an applied magnetic field and the excitation of spin waves by the electric field of a light wave.

I will discuss interactions between spin and charge degrees of freedom in Mott insulators giving rise to these effects and, in particular, a new dynamic magnetoelectric interaction which allows for control of domain walls and skyrmions with an applied electric field and is closely related to the so-called spinmotive force in magnetic conductors.