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Creating Skyrmions with Electric Fields: Experiment and Theory ALEX KRUCHKOV, Laboratory for Quantum Magnetism, EPFL, Switzerland, JONATHAN WHITE, Laboratory for Neutron Scattering and Imaging, PSI, Switzerland, IVICA ZIVCOVIC, HENRIK RNNOW, Laboratory for Quantum Magnetism, EPFL, Switzerland — Skyrmions are topologically protected nanoscale spin whirls envisaged as promising information carriers. In this talk, we report both writing and erasing skyrmions with moderate electric fields in Cu_2OSeO_3 . Using neutron scattering, we demonstrate that the skyrmion pocket either expands or shrinks significantly depending on the direction of electric fields, allowing us to write or erase the skyrmion phase in bulk. To explain the observed phenomena, the effect is addressed theoretically by using the framework of fluctuation-induced phase transitions and the first order perturbation theory in electric fields. As the electric field is almost not heating the insulating Cu_2OSeO_3 samples, our study provides further perspectives for dissipation-free electrical control of skyrmions in insulators.

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