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【108】 Controlled skyrmion lattice rotation in Cu_2OSeO_3 driven by femtosecond mid-infrared laser pulses

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The insulating multiferroic material Cu_2OSeO_3 holds the possibility to study and manipulate topological magnetic order and skyrmion dynamics in a current free environment, purely under the influence of magnons or electric field. Here we drive and control ratchet-like skyrmion rotational motion via femtosecond pulses of mid-infrared (1 eV) light, far below the bandgap of the material. We image the skyrmion lattice in real space via Lorentz transmission electron microscopy after each laser pulse. This direct manipulation via a combination of low-energy magnons and electric field (contained within the femtosecond laser pulse) could be used to build spin memory and logical devices with much lower dissipation losses than previously achieved.

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