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【107】Non-thermal generation of a new metastable skyrmion phase in Cu2OSeO3

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Metastable skyrmions with long lifetimes are attractive for various applications. However, the physics behind the non-equilibrium topological phases is far from being fully understood. We report the creation of a new hidden skyrmion phase in a Cu2OSeO3 lamella achieved by femtosecond laser excitation of the material at 5 K and a magnetic field of 15 mT. The formation of the skyrmion lattice was confirmed by Lorentz-TEM. Since this small magnetic field is below the equilibrium skyrmion pocket of our lamella, the generation of skyrmions cannot be explained by transient heating of the sample through the equilibrium skyrmion pocket. Thus, non-thermal mechanisms are involved in the skyrmion photocreation process in Cu2OSeO3.

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