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Press release

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PRL Editors' Suggestion:

Magnetic Skyrmions - Connecting Experiment and Theory

Isolated magnetic Skyrmions are in the focus of current research due to their great potential as information carriers in future spintronic devices. Using the atomic-scale resolution of our spin-resolved STM, we investigate the field-dependent size and shape of Skyrmions in a bilayer PdFe on Ir(111). For the first time, a new analytical description of Skyrmions is used to directly compare the experimental data to the original theory predicting Skyrmions, thereby validating their excellent quantitative agreement. This analytical model is subsequently also used to extract material specific parameters from our data, including the Dzyaloshinskii-Moriya constant, which has previously been found difficult to determine experimentally. We regard the precise knowledge of the spin structure of Skyrmions as a prerequisite for further explorations of their possible application in spintronic devices.

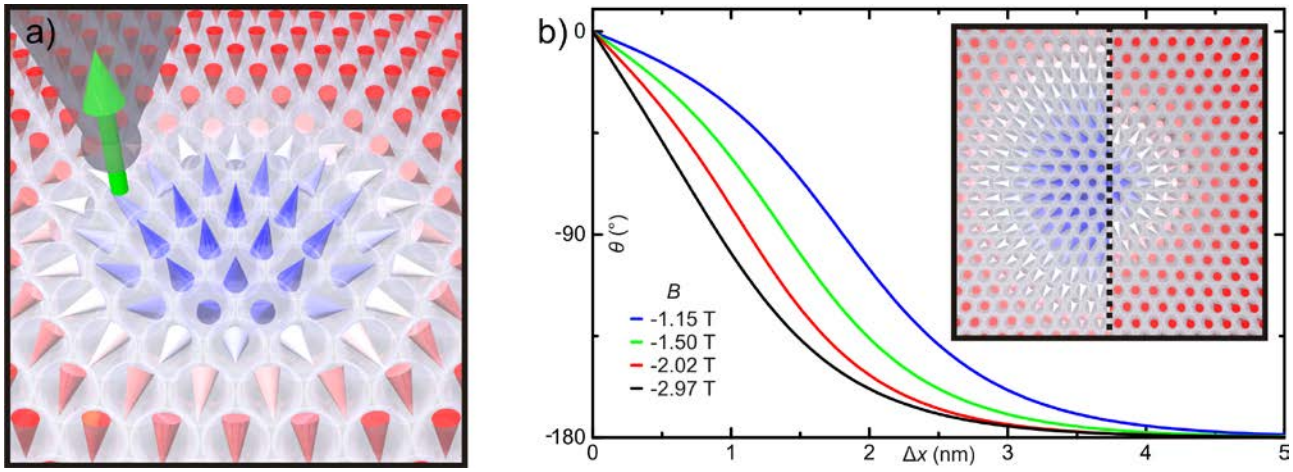

Figure caption: *Spin structure of individual Skyrmions in PdFe/Ir(111). (a) Sketch of the experimental setup of a spin-polarized STM tip probing a magnetic Skyrmion. (b) Internal spin structure of the Skyrmion as described by the new analytical model for the field values indicated. The inset shows visualization of spins with atomic distance for the lowest and highest field shown.*

Publication:

Field-Dependent Size and Shape of Single Magnetic Skyrmions,
N. Romming, A. Kubetzka, C. Hanneken, K. von Bergmann, and R. Wiesendanger,
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Related websites:
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