# Supporting Information: Stray-Field Imaging of a Chiral Artificial Spin Ice during Magnetization Reversal


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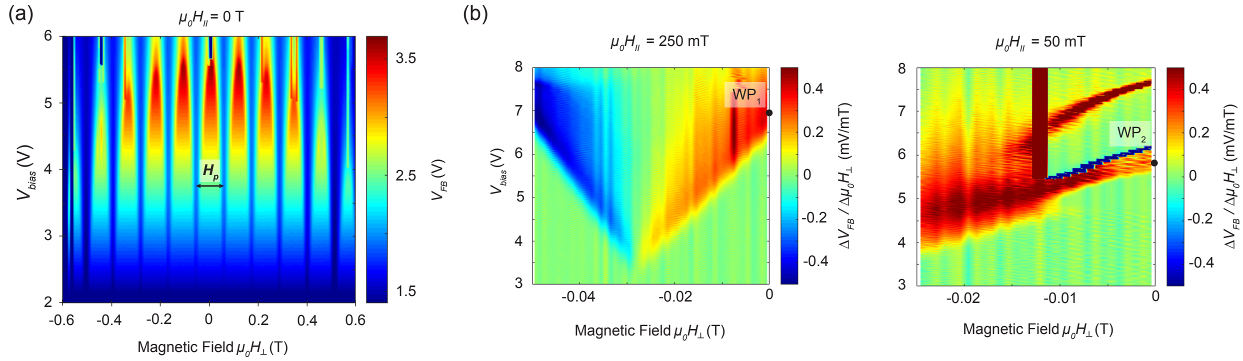


Figure S 1: Quantum interference pattern of the SQUID. Current through the nanoSQUID (color coded) versus input voltage $V_{\mathrm{bias}}$ and applied magnetic field $\mu_0 H_\perp$ showing quantum interference oscillations with a period ($H_{\mathrm{p}}$) corresponding to an effective nanoSQUID diameter of 150 nm. The measured feedback voltage ($V_{\mathrm{FB}}$) is proportional to the current flowing through the nanoSQUID. (b) shows the voltage-to-flux ($V - \Phi$) SQUID transfer function at different applied in-plane magnetic field strengths ($\mu_0 H_\|$). The transfer functions show the strong influence of the applied in-plane field on the current-to-voltage characteristics (IVC). The black dots show the position of the working point (WP) during the image acquisition using the scanning nanoSQUID.

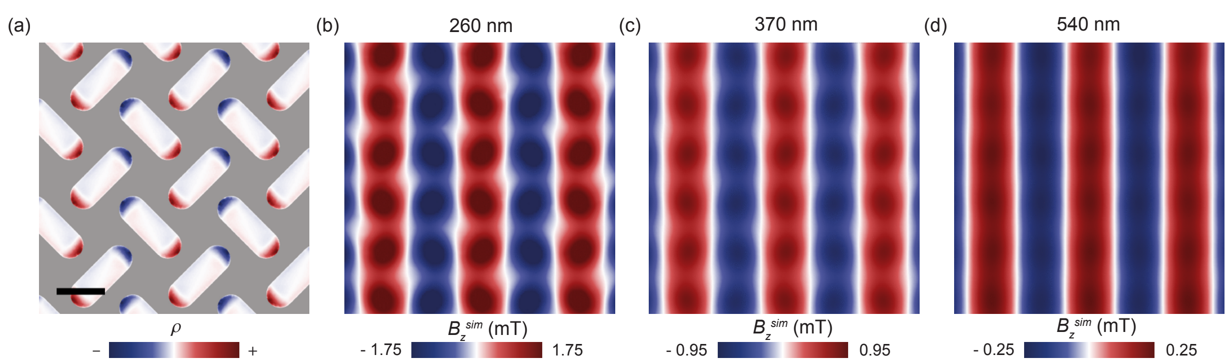


Figure S 2: Simulated evolution of the stray field patterns as a function of height with respect to the sample. The stray field is generated by the distribution of the magnetic charges in the system. In (a), the simulated magnetostatic charge density, $\rho = -\mu_0(\boldsymbol{\nabla} \cdot \boldsymbol{M})$, is plotted, showing that volume magnetic charges are present at the extremities of the nanomagnets, where the magnetization is not uniform. The scale bar represents 500 nm. Images (b-d) illustrate the evolution of the stray field patterns at different heights above the sample. All simulations are performed in the absence of an external field: $\mu_0 H_\| = 0$.

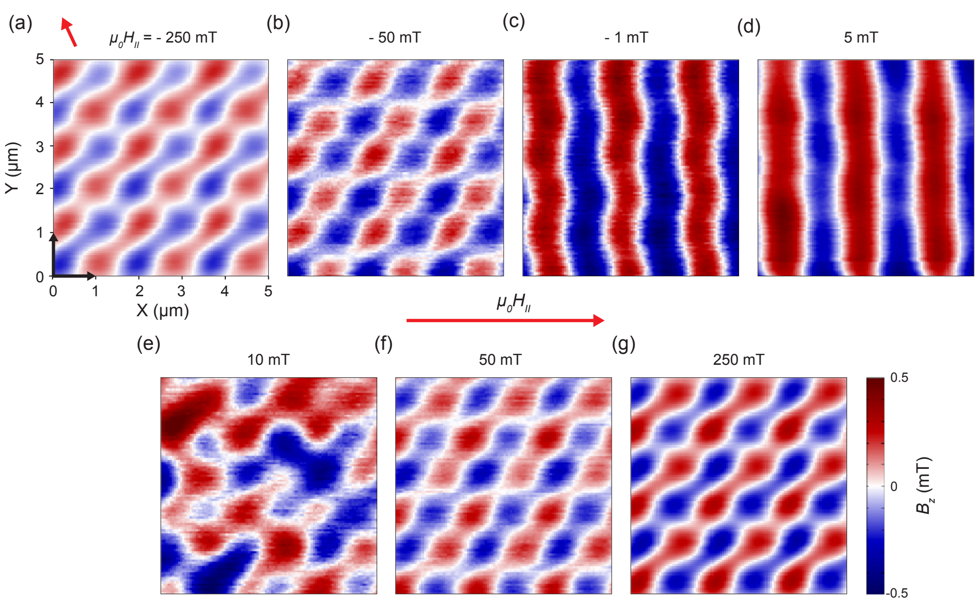


Figure S 3: In-plane field hysteresis loop. (a-g), Shows a series of measured magnetic stray field distributions $B_z$(x,y) of a chiral artificial spin ice system at different in-plane magnetic fields $\mu_0 H_{\|}$. Starting field $\mu_0 H_{\|}$ = -250 mT in (a) towards $\mu_0 H_{\|}$ = 250 mT in (g). The color bar of (g) corresponds also to (a-g).