Dear Dr. Hirsch,

thank you for publishing our manuscript “Probing the Pinning Strength of Magnetic Vortex Cores with sub-nm Resolution” NCOMMS-20-02870. We followed all requirements of your last email in detail as described below and uploaded the modified files. We hope that the manuscript is now adequate for publication. I am available for any further requests, remarks or questions.

Best regards

Markus Morgenstern

Description of Additional Supplementary Files

Supplementary Movie 1
Supplementary Movie 1 sequentially shows 45 $dl/dV$-images recorded at $B_\perp = -1.5$ T, while moving the vortex core by 44 equidistant $B_\parallel$ steps with $\Delta B_\parallel = (136,-227)$ $\mu$T. These images are also used to determine the core positions shown in Fig. 1f of the main text. Each $dl/dV$ image covers an area of 15x15 nm$^2$. Experimentally, 60x60 pixels are recorded at $V = -2$ V, $I = 1$ nA and modulation voltage of 50mV$_{\text{RMS}}$. To optimize visibility, additional interpolated pixels are displayed in the movies. The scan frame center is moved linearly between adjacent images by a vector deduced from centering the core in initial and final image.

Supplementary Movie 2
Supplementary Movie 2 shows the same data as Supplementary Movie 1 in different color scale and overlaid on a separately measured topography of the whole area. Here, the $dl/dV$-images are displayed after subtracting the contrast originating from in-plane magnetization and multiplying the image with a Gaussian intensity profile as described in Supplementary Note 3. Additional minor shear and stretch transformations by ~1% are applied to remove the effects of piezo creep.