

Finite size effects on the metamagnetic phase transition in a thick B2 FeRh nanocluster film

Here are presented figures as Electronic Supplementary Information.

1. TEM/EDX IN CROSS SECTION

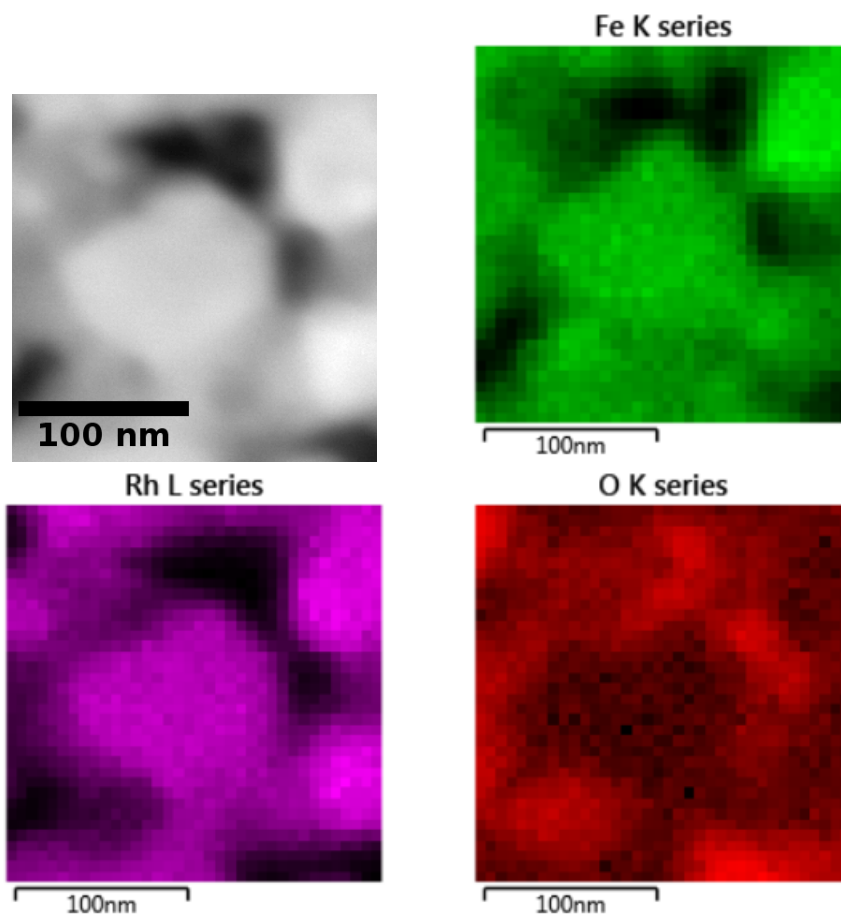


Fig. S1. TEM/EDX map performed on the annealed FeRh thick sample in cross section: TEM (white) and EDX maps for Fe (green), Rh (purple) and O (red) over a FeRh nanocluster assembled lamella

2. RBS

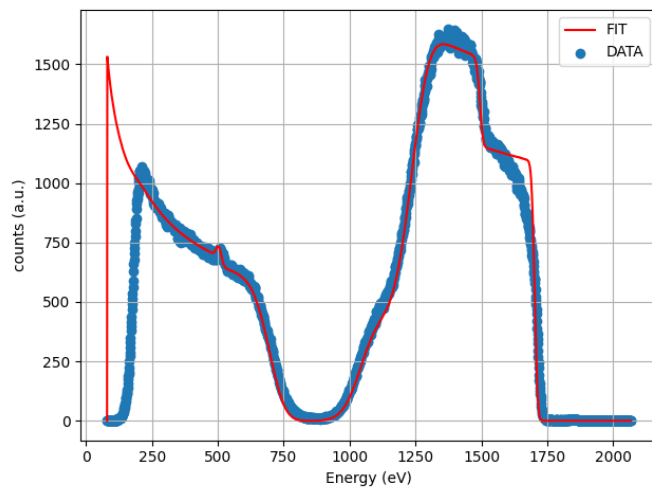


Fig. S2. Rutherford back-scattering spectroscopy for the annealed FeRh thick film over Si substrate: experimental (blue) and the respective fit (red)

3. HARD X-RAY ABSORPTION SPECTROSCOPY: XAS/XMCD BEFORE AND AFTER ANNEALING

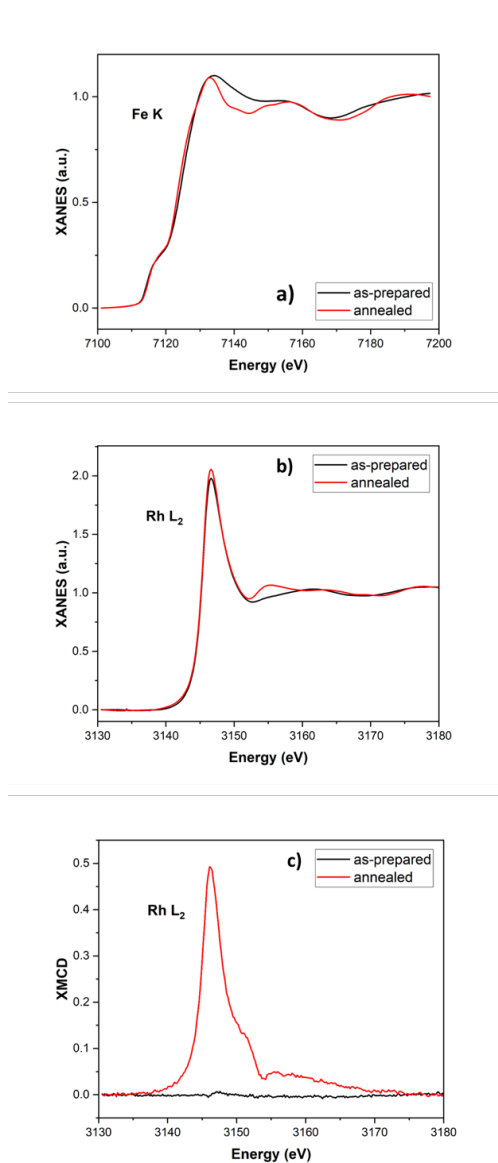


Fig. S3. Hard X-ray absorption spectroscopy (XAS) of the FeRh thick sample at Fe K edge (a) and at the Rh L_2 edge under 7 Tesla at 320K (b) before (black) and after annealing (red) revealing two different crystallographic signatures, characteristic of a chemically disordered FCC A1 alloyed phase and a chemically ordered CsCl B2 alloyed FeRh phase, respectively. XMCD corresponding signal at the Rh L_2 edge under 7 Tesla at 320K (c) before (black) and after annealing (red)

4. SOFT X-RAY ABSORPTION SPECTROSCOPY: XAS/XMCD IN TEY ON ANNEALED SAMPLE BEFORE REDUCTION

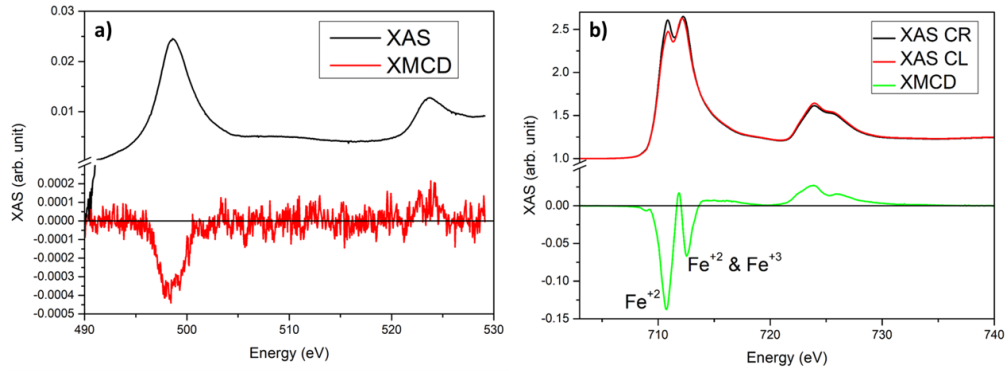


Fig. S4. Soft X-ray absorption spectroscopy (XAS) and X-ray magnetic circular dichroism (XMCD) obtained on the annealed FeRh thick sample before reduction, at the Rh $M_{2,3}$ (a) edge and at the Fe $L_{2,3}$ (b) at room temperature and under 1.5 T.

5. SOFT X-RAY ABSORPTION SPECTROSCOPY: XMCD IN TFY ON ANNEALED SAMPLE AFTER REDUCTION

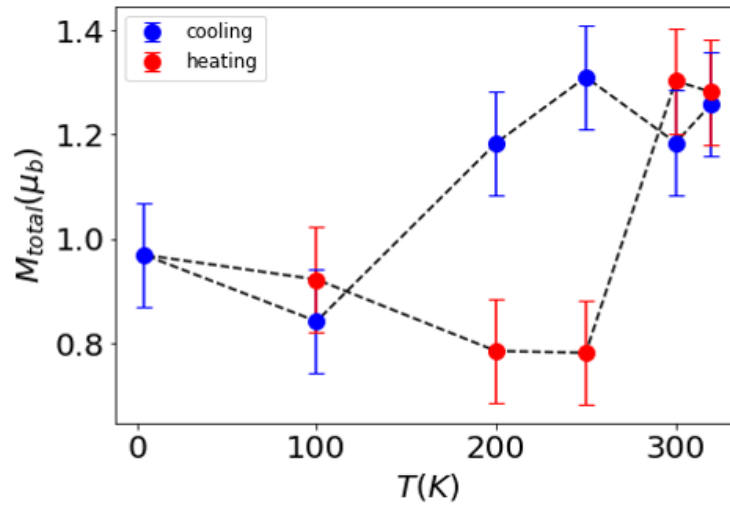


Fig. S5. Temperature dependence of the Fe total magnetic moment of the annealed FeRh sample measured from the thermal XMCD evolution at the Fe L_3 edge under 6 T in TFY mode (to compare with Fig. 6c simultaneously measured in TEY mode)