Supplementary Material

Table S1. Experimental details for the feiite crystals probed.

	Crystal 1	Crystal 2	Crystal 3
Crystal data			
Chemical formula	$Ti_{0.46}Fe_{3.54}O_5$	$Ti_{0.60}Fe_{3.40}O_5$	$Ti_{0.48}Fe_{3.52}O_5$
M_r	303.4	303.4	303.4
Crystal system, space group	Orthorhombic, *Cmcm*		
Temperature (K)	293		
a, b, c (Å)	2.9268 (7), 9.8181 (15), 12.592 (9)	2.9288 (10), 9.847 (3), 12.598 (11)	2.9263 (7), 9.846 (3), 12.597 (13)
V (Å^3)	361.8 (3)	363.3 (4)	363.0 (4)
Z	4		
Radiation type	Synchrotron, λ = 0.29521 Å		
μ (mm^{-1})	1.26	1.23	1.25
Crystal size (mm)	~ 0.04 × 0.02 × 0.06		
Data collection			
Diffractometer	13BMD, APS		
Absorption correction	*Multi-scan* *CrysAlis PRO* 1.171.41.115a (Rigaku Oxford Diffraction, 2021) Empirical absorption correction using spherical harmonics, implemented in SCALE3 ABSPACK scaling algorithm.		
T_{min}, T_{max}	0.208, 1.000	0.227, 1.000	0.106, 1.000
No. of measured, independent and observed [$I > 2\sigma(I)$] reflections	633, 259, 201	478, 214, 176	478, 203, 172
R_{int}	0.024	0.048	0.026
$(\sin\theta/\lambda)_{max}$ (Å^{-1})	0.817	0.813	0.805
Refinement			
$R[F^2 > 2\sigma(F^2)]$, $wR(F^2)$, S	0.040, 0.105, 1.08	0.066, 0.187, 1.16	0.056, 0.175, 1.10
No. of reflections	259	214	203
No. of parameters	24	24	24
$\Delta\rho_{max}$, $\Delta\rho_{min}$ (e Å^{-3})	1.18, −1.10	1.46, −1.34	1.40, −1.10

Figure S1.

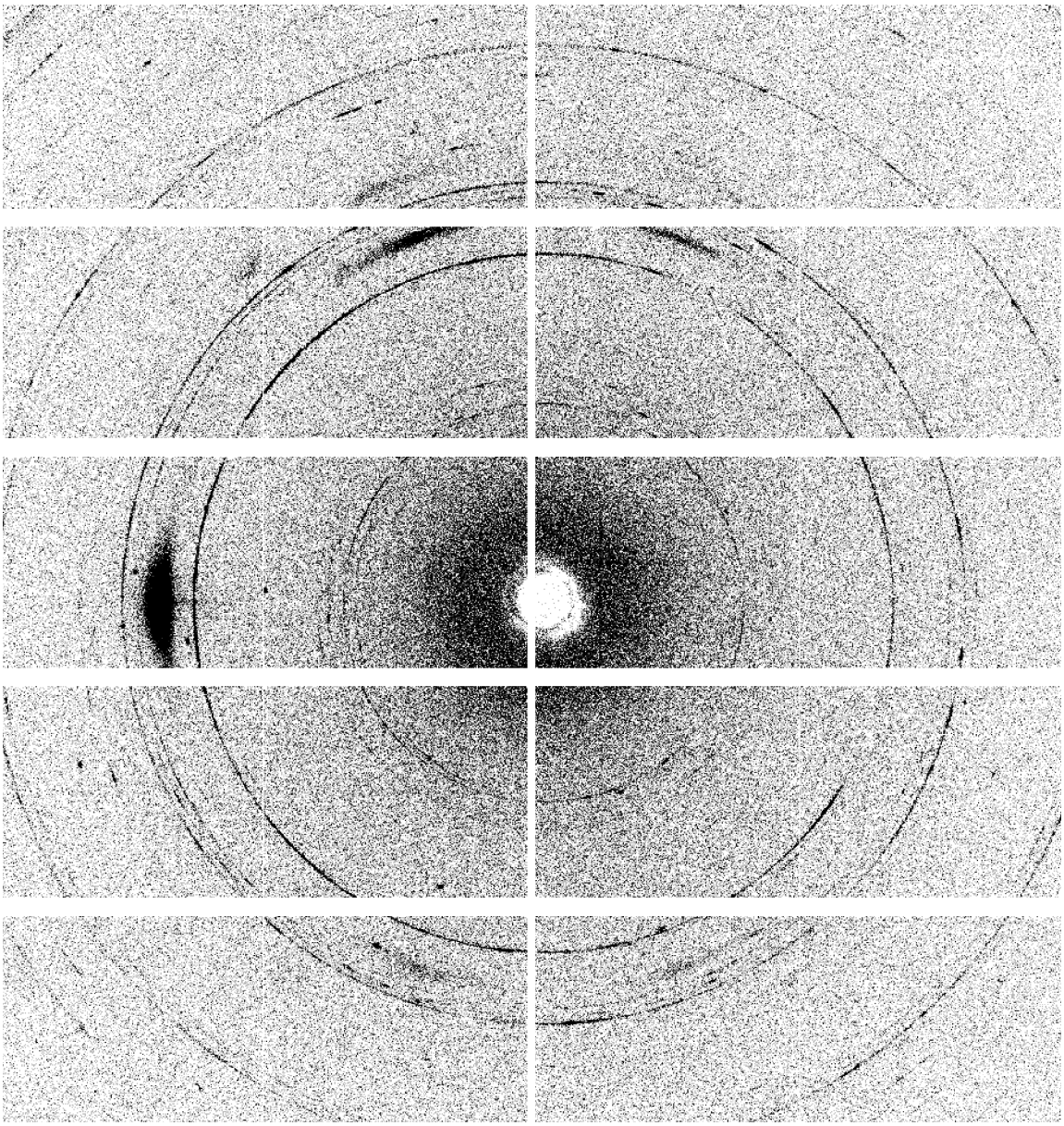

Figure S1. Diffraction image collected at the edge of the Feiite crystal sample demonstrating that the Debeye rings observed are unrelated to the sample. The diffraction rings are instead associated with air scattering from the pinhole.