

Supporting Information

Helimagnetism in MnBi_2Se_4 Driven by Spin-Frustrating Interactions Between Antiferromagnetic Chains

Judith K. Clark,^{a,#} Chongin Pak,^{a,b,#} Huibo Cao,^c Michael Shatruk^{a,b,*}

^a *Department of Chemistry and Biochemistry, Florida State University, Tallahassee, FL 32306, United States*

^b *National High Field Magnetic Laboratory, Tallahassee, FL 32310, United States*

^c *Neutron Scattering Division, Oak Ridge National Laboratory, Oak Ridge, TN 37830, United States*

Both authors contributed equally to this work.

* Corresponding author: mhatruk@fsu.edu.

Figure S1. Powder diffraction patterns of MnSe and MnBi_2Se_4 precursors	S2
Figure S2. Curie-Weiss fit of the inverse susceptibility for $H \parallel b$ and $H \perp b$	S3
Figure S3. Intensity of the (0 0.356 2) neutron diffraction peak as a function of temperature	S3
Figure S4. Plot of observed vs. calculated squared structure factors for magnetic structure refinement.....	S4

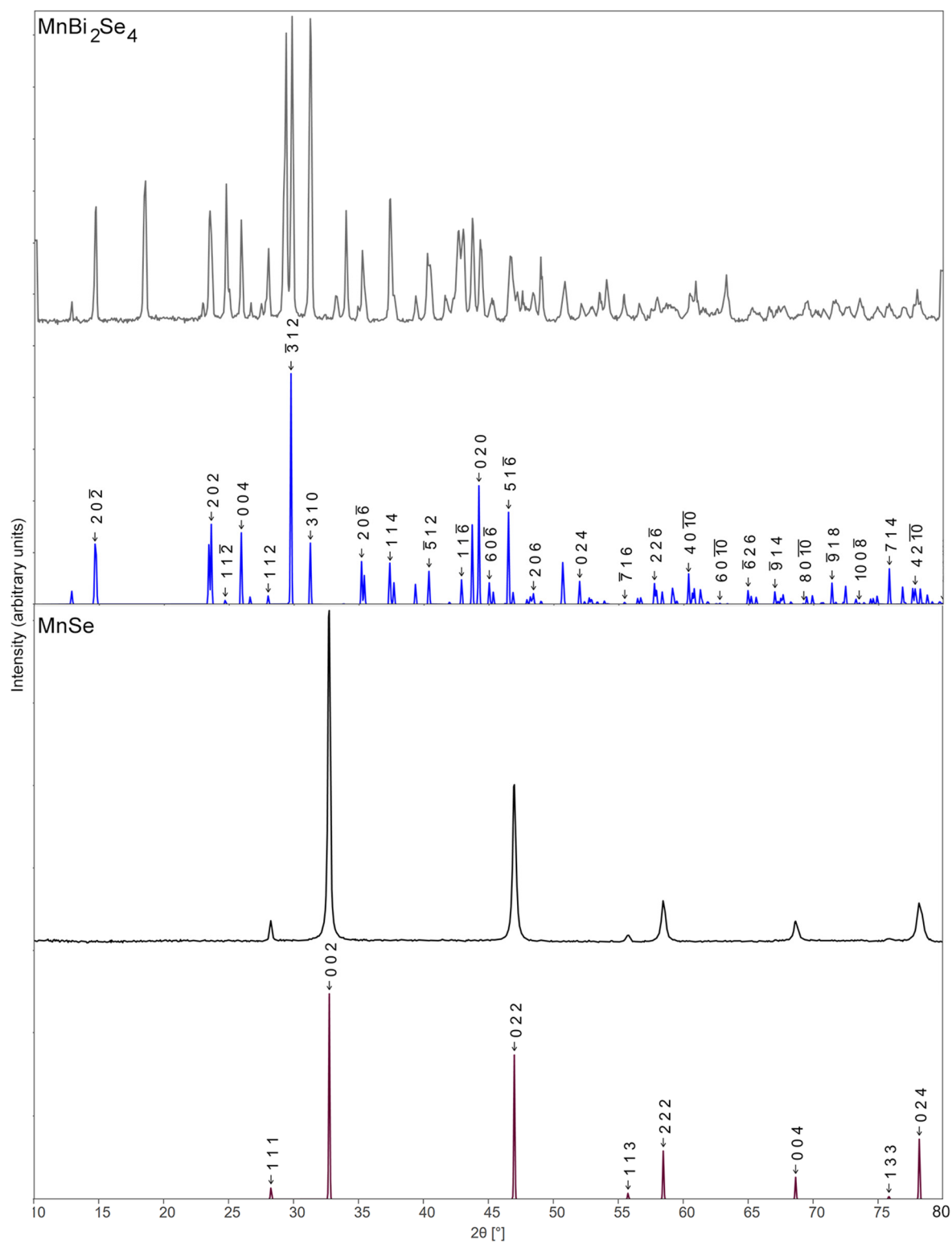


Figure S1. Experimental and calculated powder diffraction patterns of MnSe and MnBi₂Se₄ precursors.

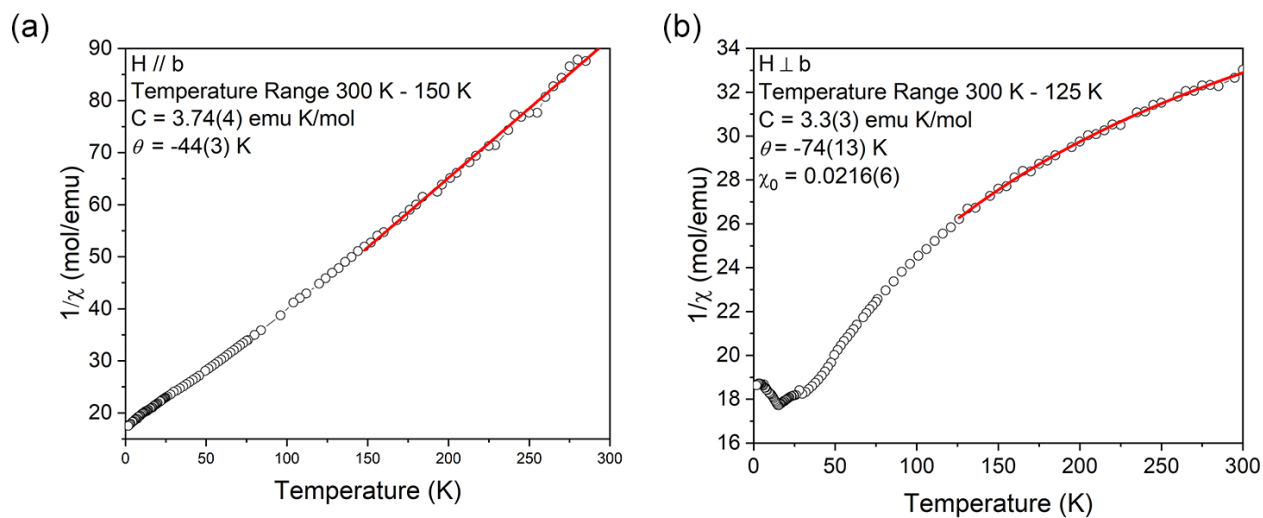


Figure S2. Curie-Weiss fitting for $H \parallel b$ and $H \perp b$ showing the inverse (a) and modified fit (b).

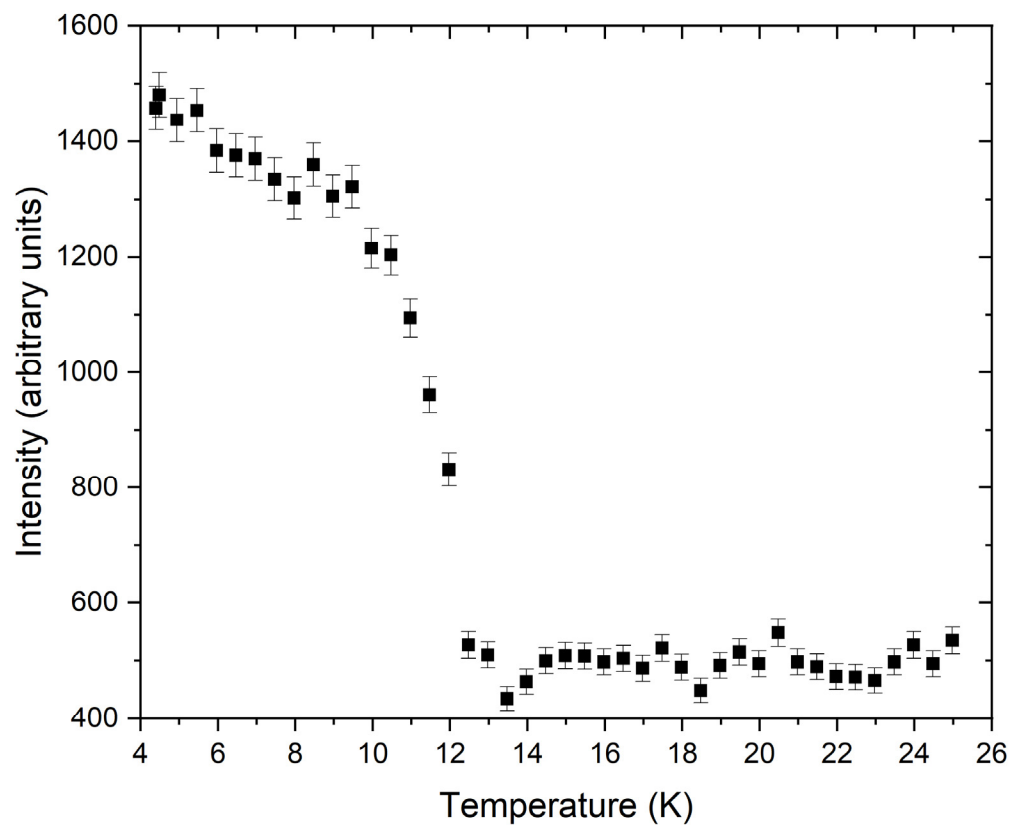


Figure S3. Intensity of the $(0\ 0.356\ 2)$ neutron diffraction peak as a function of temperature.

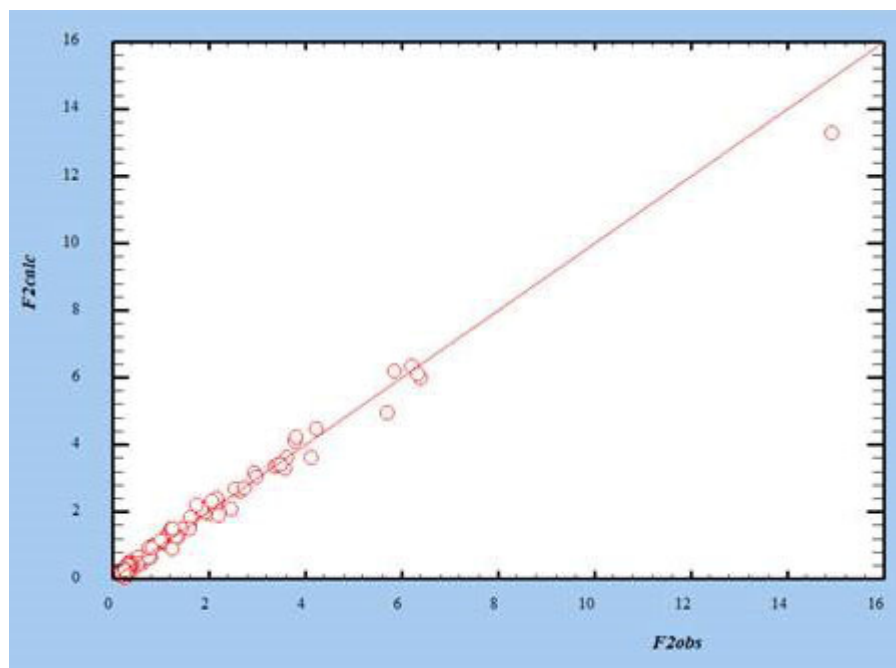


Figure S4. The correlation plot showing the agreement between the observed and calculated F^2 values for the magnetic structure refinement of MnBi_2Se_4 .