Supplementary information for:

Hypogenic caves of Syracuse area, Sicily (Italy): geomorphological evidence of CO_2 degassing, fresh-salt water mixing, and late condensation corrosion

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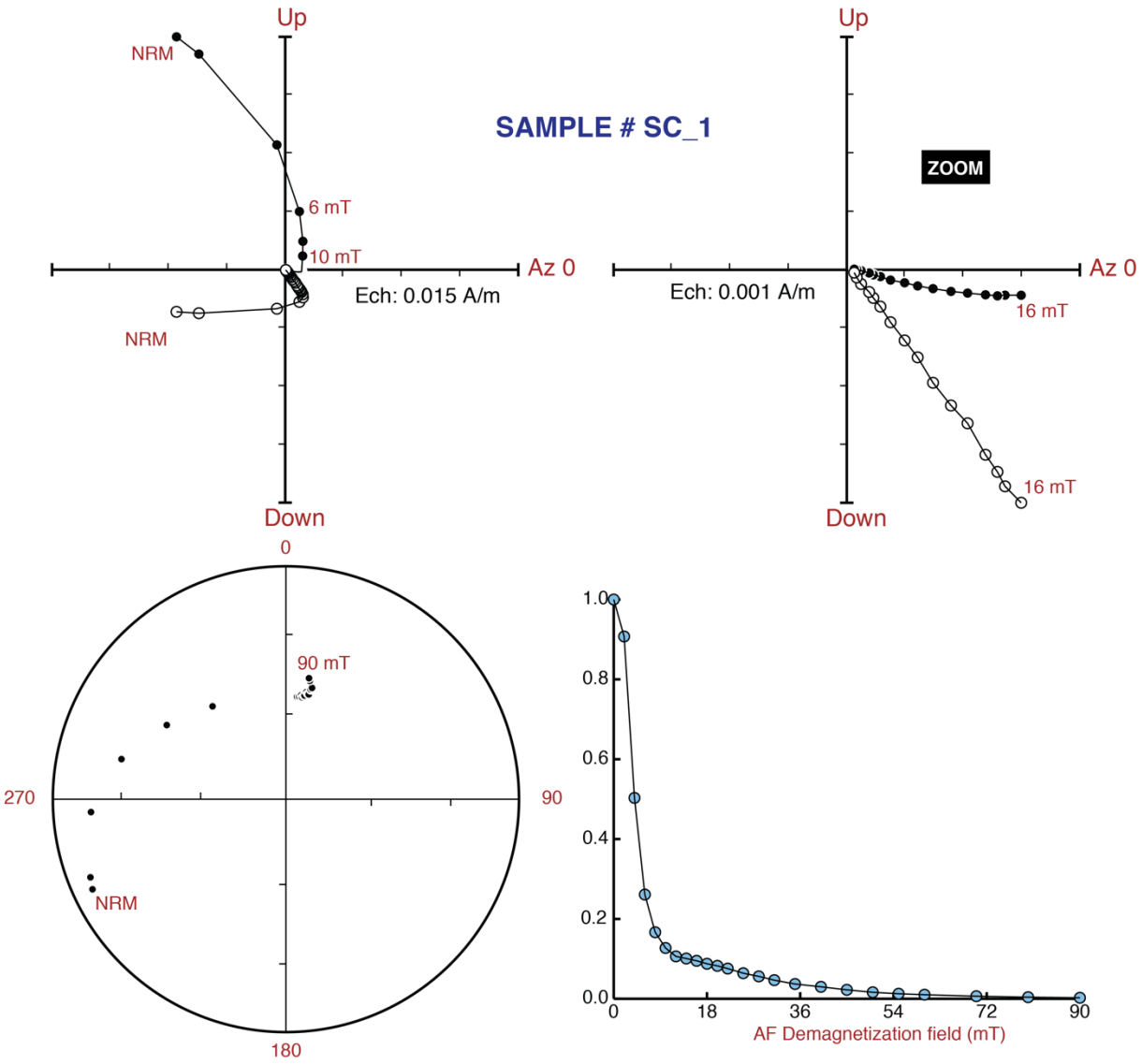
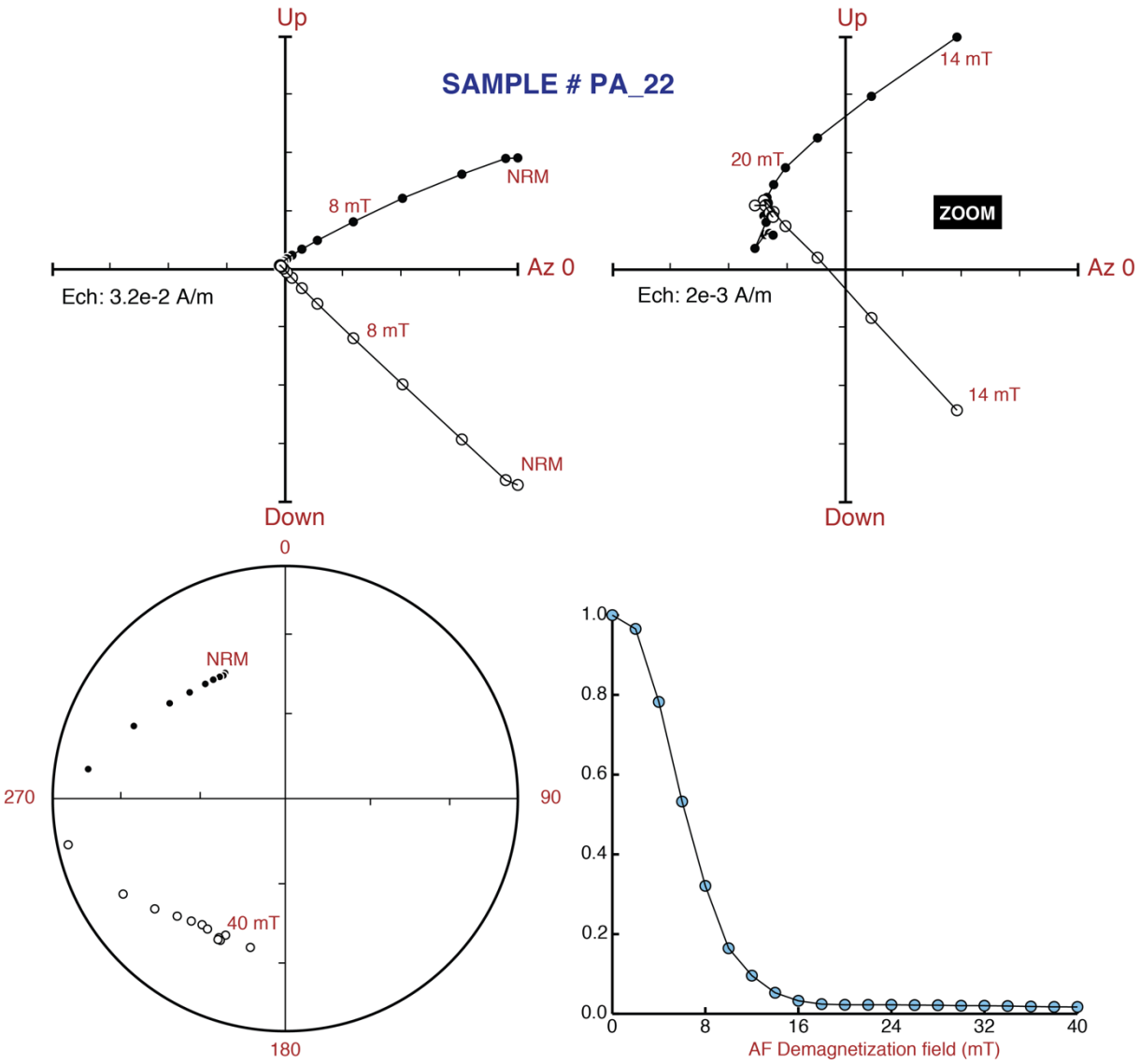
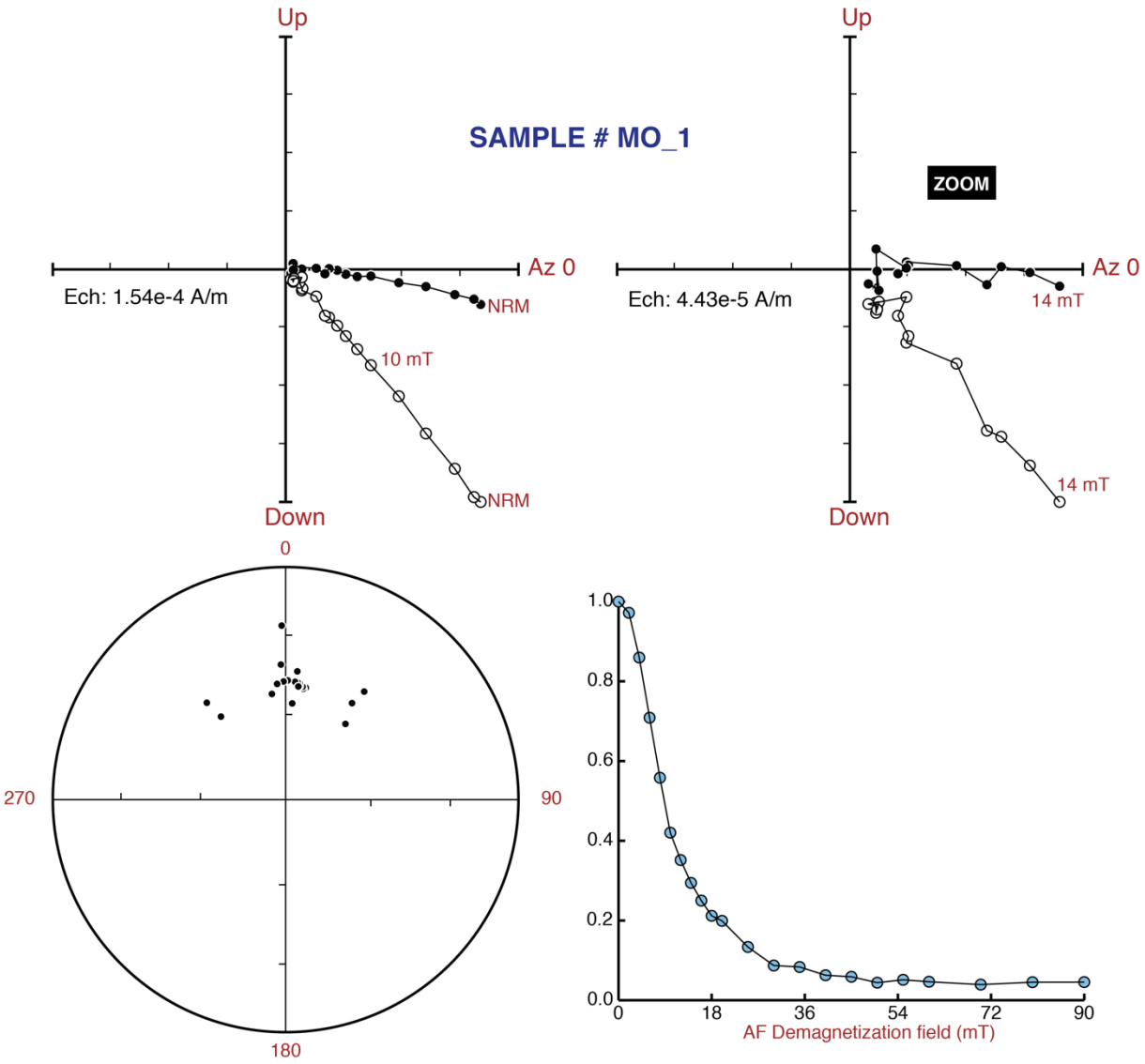


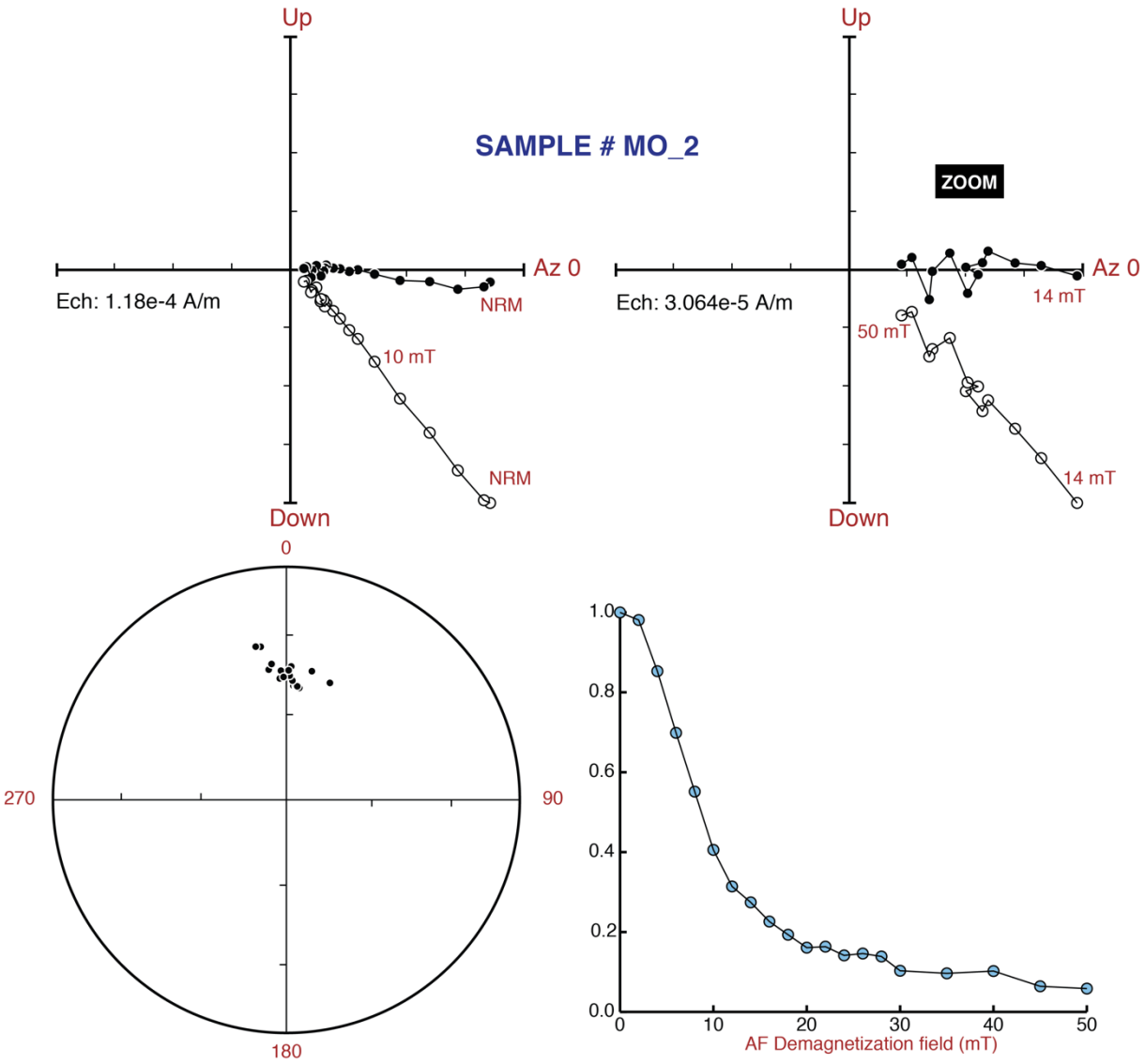
Supplementary Fig. S1. Zijderveld diagram of SC.1 sample.



Supplementary Fig. S2. Zijderveld diagram of PA.22 sample.



Supplementary Fig. S3. Zijderveld diagram of MO.1 sample.



Supplementary Fig. S4. Zijderveld diagram of MO.2 sample.

Supplementary Table S1. ^{230}Th dating results. The error is 2σ. U decay constants: $\lambda_{238} = 1.55125 \times 10^{-10}$ (Jaffey et al., 1971), $\lambda_{234} = 2.82206 \times 10^{-6}$ (Cheng et al., 2013), and Th decay constant: $\lambda_{230} = 9.1705 \times 10^{-6}$ (Cheng et al., 2013).

Sample	^{238}U (ppb)	^{232}Th (ppt)	^{230}Th/^{232}Th (atomic ×10^{-6})	$\delta^{234}U_m$*	^{230}Th/^{238}U (activity)	^{230}Th age (yr BP§; uncorr.)	^{230}Th age (yr BP; corr.)	$\delta^{234}U_i$** (corr.)	^{230}Th age (yr BP; corr.)
Palombara	1292.5 ± 4.6	273134 ± 5547	82 ± 2	36.3 ± 2.1	10476 ± 0.0045	60814 ± 209279	**603447 ± 182457**	199 ± 140	**603379† ± 182457**

*$\delta^{234}U_{measured} = ([^{234}U/^{238}U]_{activity} - 1) \times 1000$. **$\delta^{234}U_{initial}$ was calculated based on ^{230}Th age (T), i.e., $\delta^{234}U_i = \delta^{234}U_m \times e^{\lambda_{234} \times T}$. Corrected ^{230}Th ages assume the initial ^{230}Th/^{232}Th atomic ratio of $4.4 \pm 2.2 \times 10^{-6}$. This is the value for a material at secular equilibrium, with the bulk Earth ^{232}Th/^{238}U value of 3.8. The errors are arbitrarily assumed to be 50%. §BP stands for "Before Present" where "Present" is defined as the year AD 1950. †The age does not plot directly at secular equilibrium but does so within analytical uncertainty.

Supplementary references

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Jaffey, A.H., Flynn, K.F., Glendenin, L.E., Bentley, W.C., Essling, A.M., 1971. Precision measurement of half-lives and specific activities of ^{235}U and ^{238}U. Physical Review C, 4(5), 1889–1906. https://doi.org/10.1103/PhysRevC.4.1889