

Wang, N., Zhang, Z., Malusà, M.G., Chew, D., Wu, L., Xiang, D., and Xiao, W., 2023, Late Mesozoic impact of paleo-Pacific subduction on the North China craton revealed by apatite U-Pb and fission-track double dating and trace element analyses in the eastern Yanshan fold belt, northeastern Asia: GSA Bulletin, <https://doi.org/10.1130/B36751.1>.

Supplemental Material

Figure S1. Outcrop photographs showing the main observed lithologies and facies of the sedimentary rocks in the western Liaoning province in eastern Yanshan fold belt, northeastern Asia.

Figure S2. Photomicrographs of the bedrock and sandstone samples in the eastern Yanshan fold belt, northeastern Asia.

Figure S3. The ^{207}Pb corrected weighted mean $^{206}\text{Pb}/^{238}\text{U}$ ages of sample Y2.

Figure S4. Part of the detrital apatite fission track radial plots, and the colour of single-grain AFT ages correspond to their AU-Pb ages.

Figure S5. Kernel density estimate of detrital apatite U-Pb ages using $^{206}\text{Pb}/^{238}\text{U}$ ages corrected by ^{204}Pb within 30% error.

Figure S6. Chondrite normalized $(\text{La}/\text{Sm})_{\text{CN}}$ versus chondrite normalized $(\text{La}/\text{Lu})_{\text{CN}}$ plot for samples Y1, 2, and 7.

Figure S7. Chondrite normalized rare earth element (REE) pattern using the single apatite grain for each sample.

Figure S8. AFT radial plots from sample Y12, Y8, and Y9, deconvolved based on their apatite U-Pb ages.

Figure S9. The overall weighted mean (^{207}Pb corrected) $^{206}\text{Pb}/^{238}\text{U}$ ages and AU-Pb Terra-Wasserburg concordia lower-intercept ages of McClure apatite grains.

Table S1. Apatite U-Pb dating results of the eastern Yanshan fold belt, northeastern Asia.

Table S2. Apatite trace element analysis results of the eastern Yanshan fold belt, northeastern Asia.

Table S3. Apatite fission track analysis results of the eastern Yanshan fold belt, northeastern Asia.

Table S4. Key apatite trace element ratios and U-Pb age information of bedrocks of the eastern Yanshan fold belt, northeastern Asia.

Table S5. Published detrital zircon U-Pb age data of the eastern Yanshan fold belt, northeastern Asia.

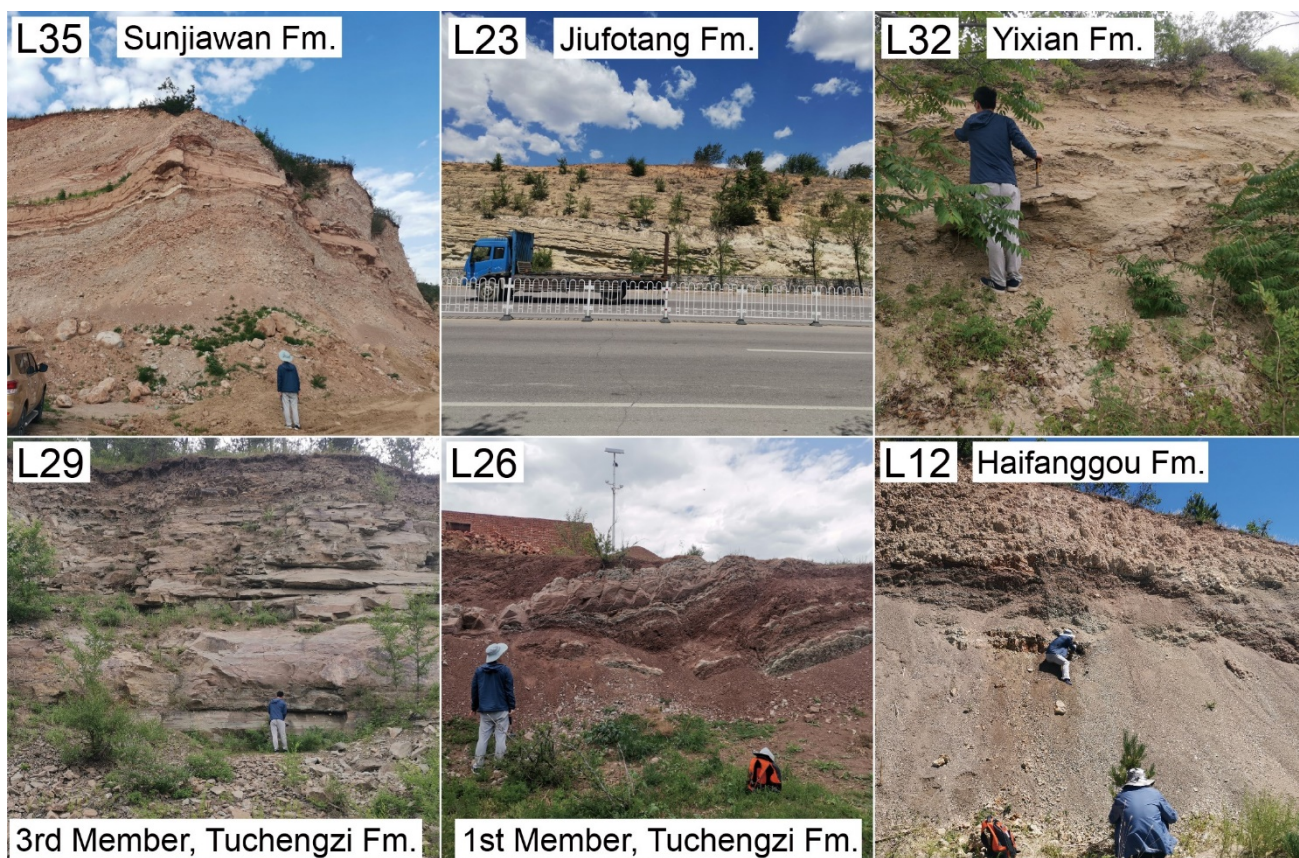


Figure S1. Outcrop photographs showing the main observed lithologies and facies of the sedimentary rocks in the western Liaoning province in eastern Yanshan fold belt, northeastern Asia.

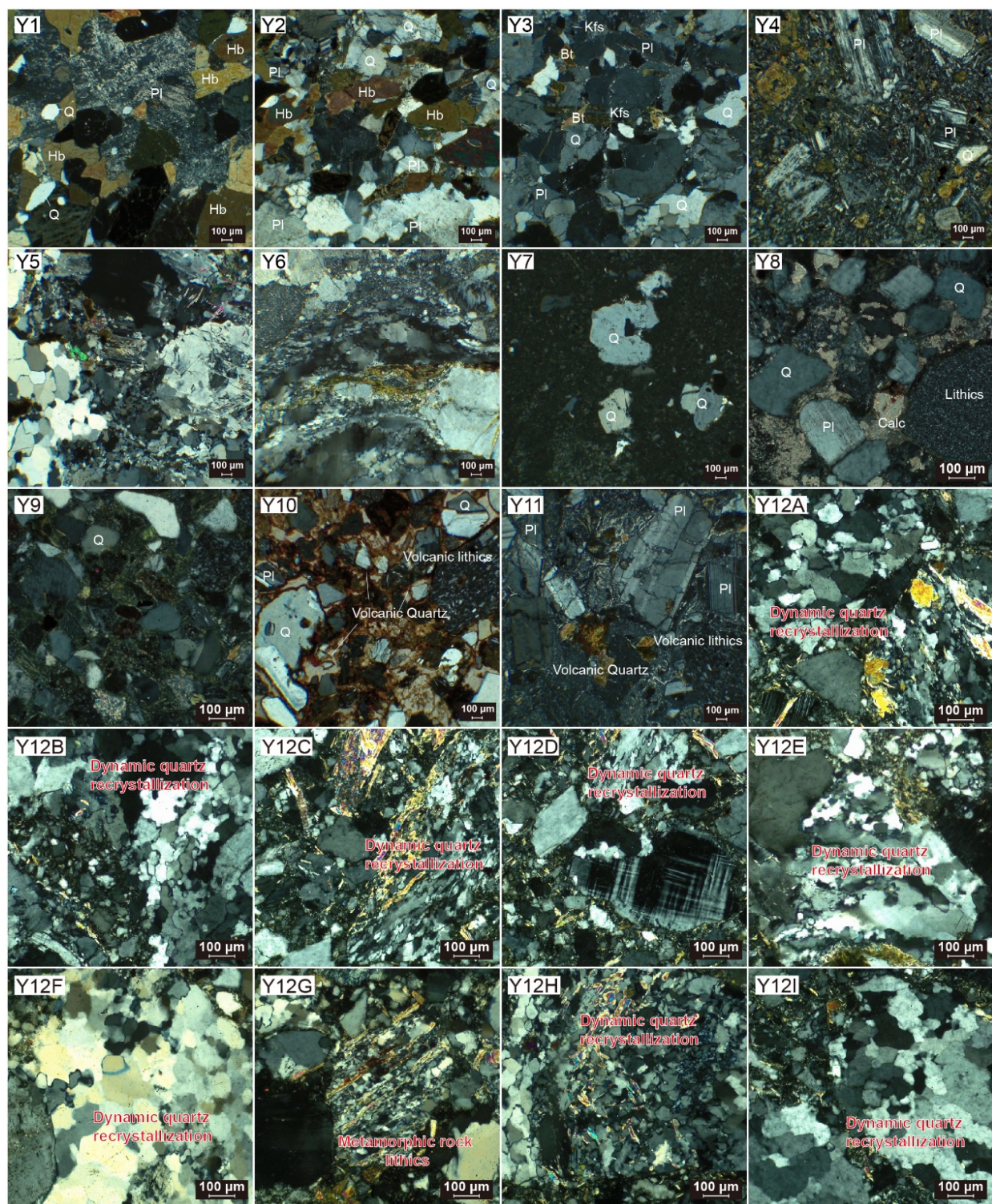


Figure S2. Photomicrographs of the bedrock and sandstone samples in the eastern Yanshan fold belt, northeastern Asia. Y1-Y6 are from the bedrock samples, and Y7-Y12 are from the sandstone samples.

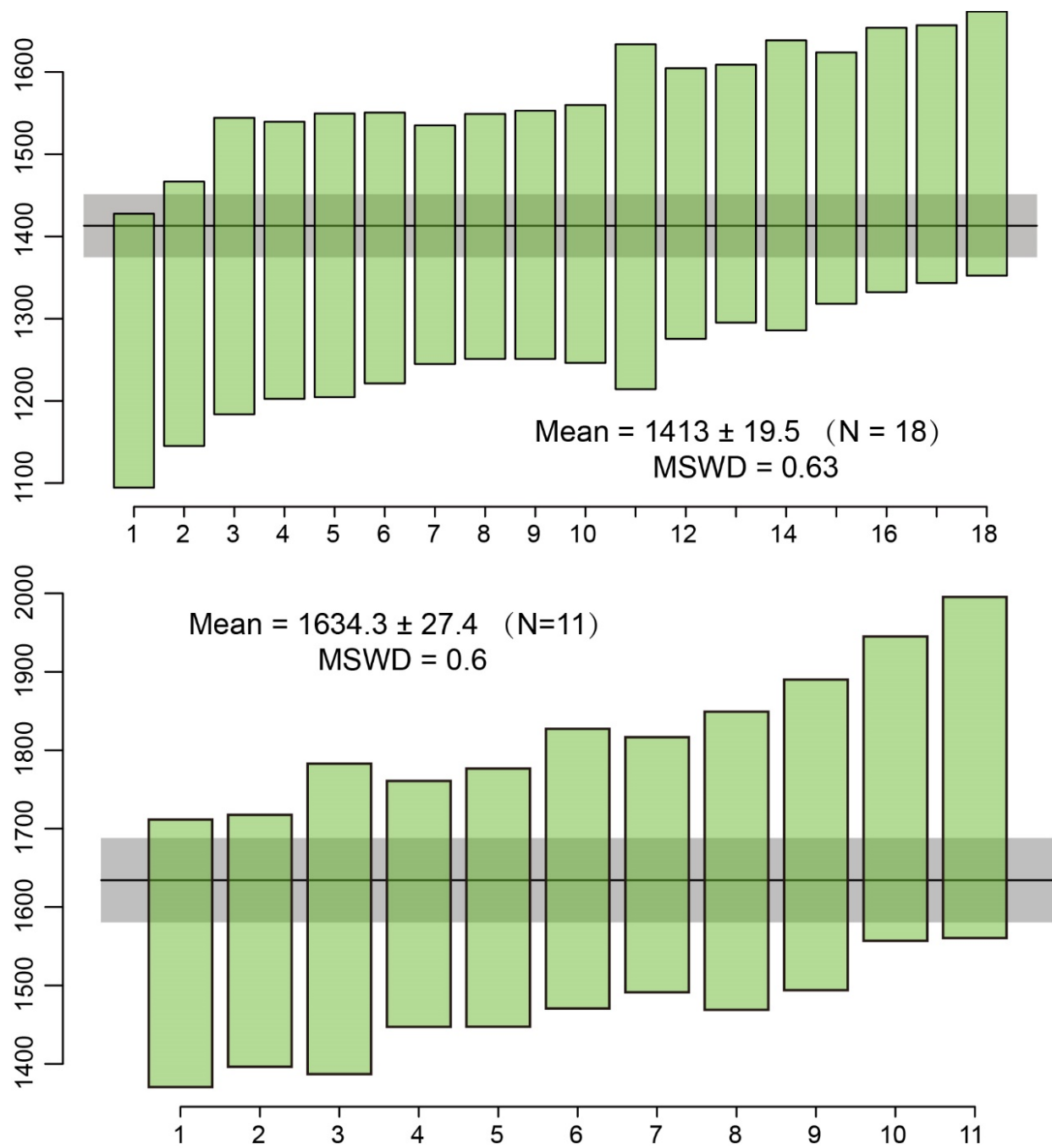


Figure S3. The ^{207}Pb corrected weighted mean $^{206}\text{Pb}/^{238}\text{U}$ ages of sample Y2.

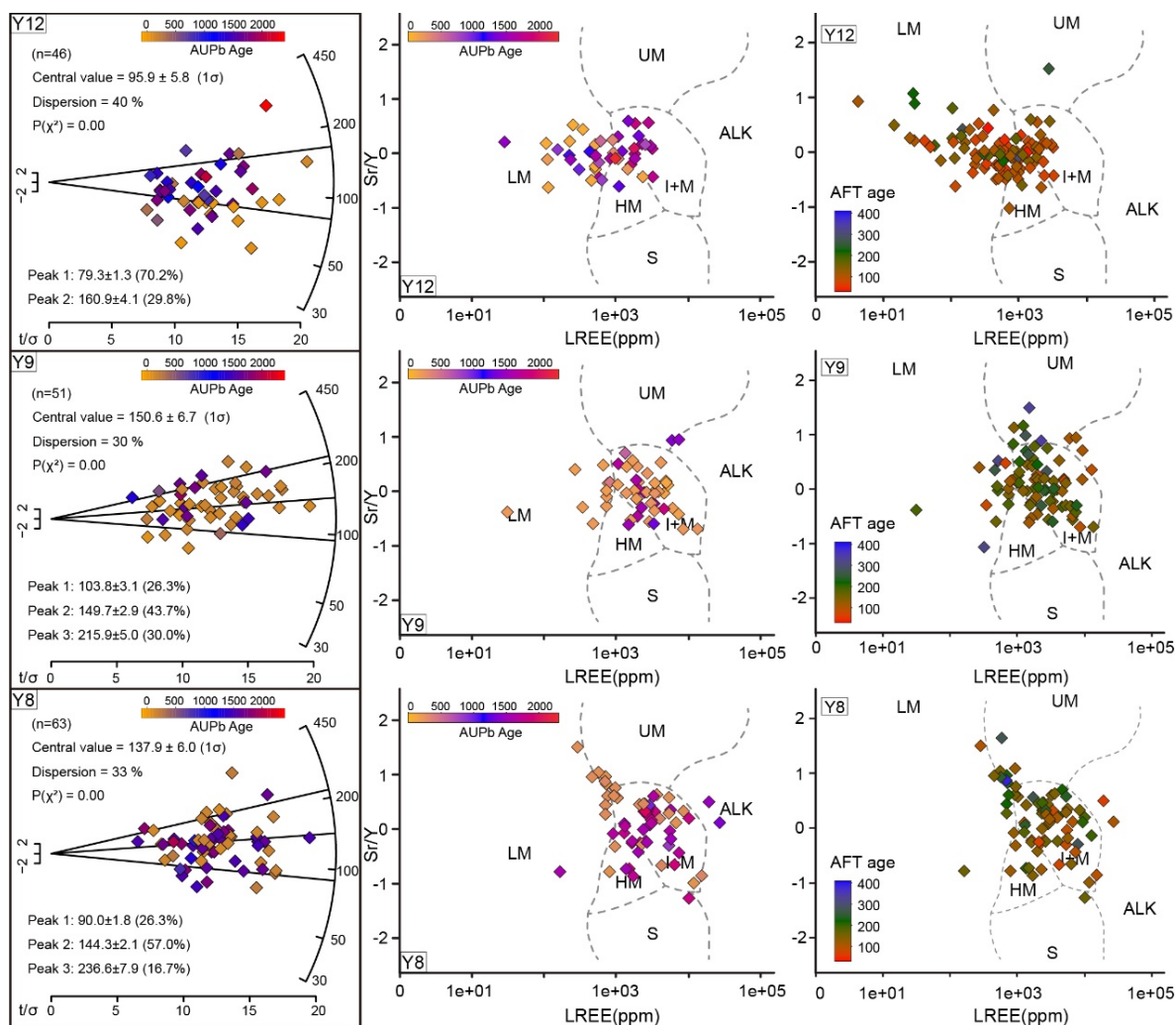


Figure S4. Part of the detrital apatite fission track radial plots, and the colour of single-grain AFT ages correspond to their AU-Pb ages. The black lines indicate statistically AFT population ages decomposed by Isoplot R (Vermeesch, 2018). Part of the support vector machine (SVM) apatite categorization scheme (Sr/Y vs LREE [La, Ce, Pr, Nd]) of the sedimentary rock samples are modified from (Chew et al., 2020), using the bedrock apatite database of O'Sullivan et al. (2018, 2020). Acronyms for groups on SVM biplots: ALK = alkali-rich igneous rocks; I + M = I-type granitoids and mafic igneous rocks; LM = low- and medium-grade metamorphic and metasomatic; HM = high-grade metamorphic; S = S-type granitoids; UM = ultramafic igneous. Grains from these samples are colored based on the AFT ages or AU-Pb ages.

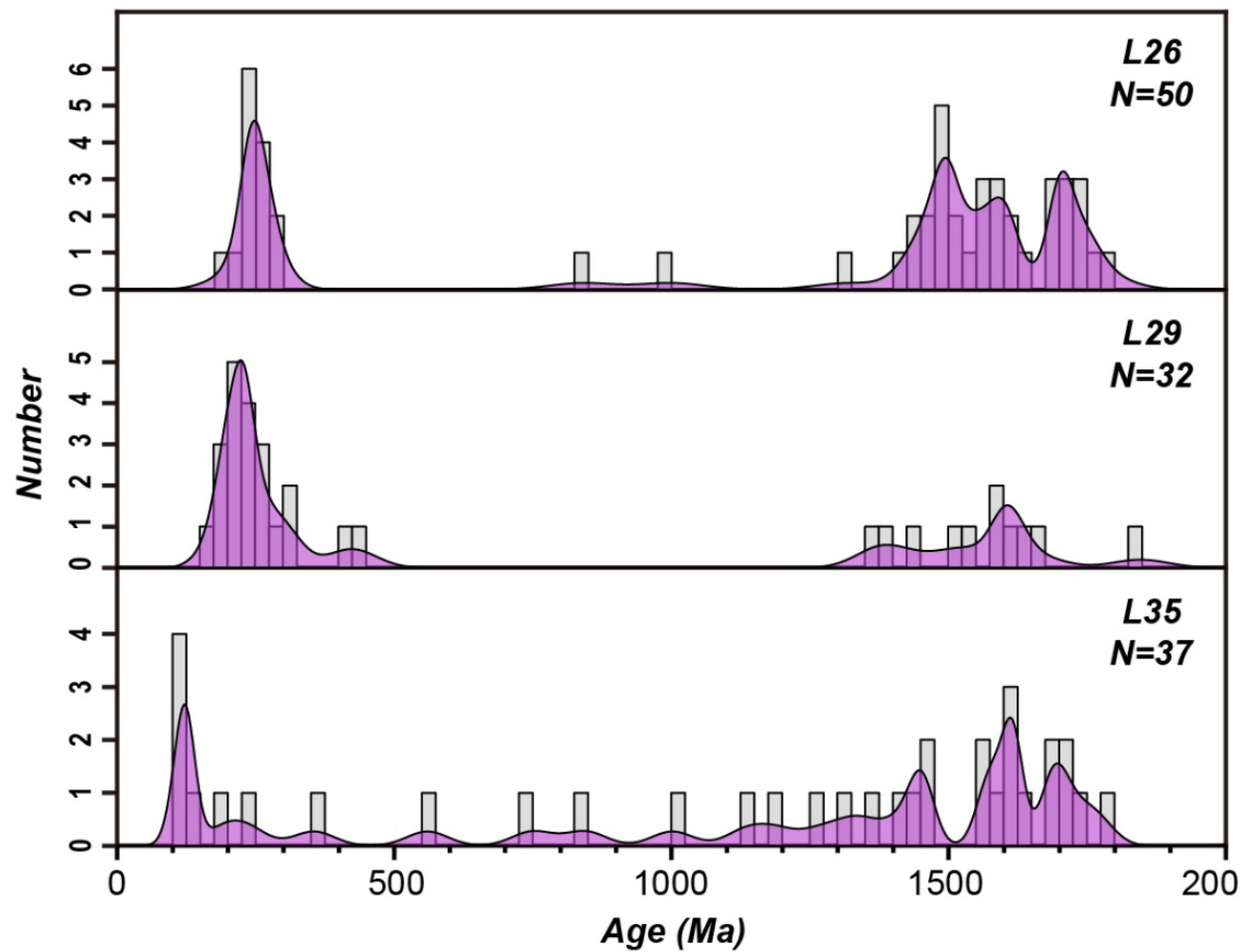


Figure S5. Kernel density estimate of detrital apatite U-Pb ages using $^{206}\text{Pb}/^{238}\text{U}$ ages corrected by ^{204}Pb within 30% error.

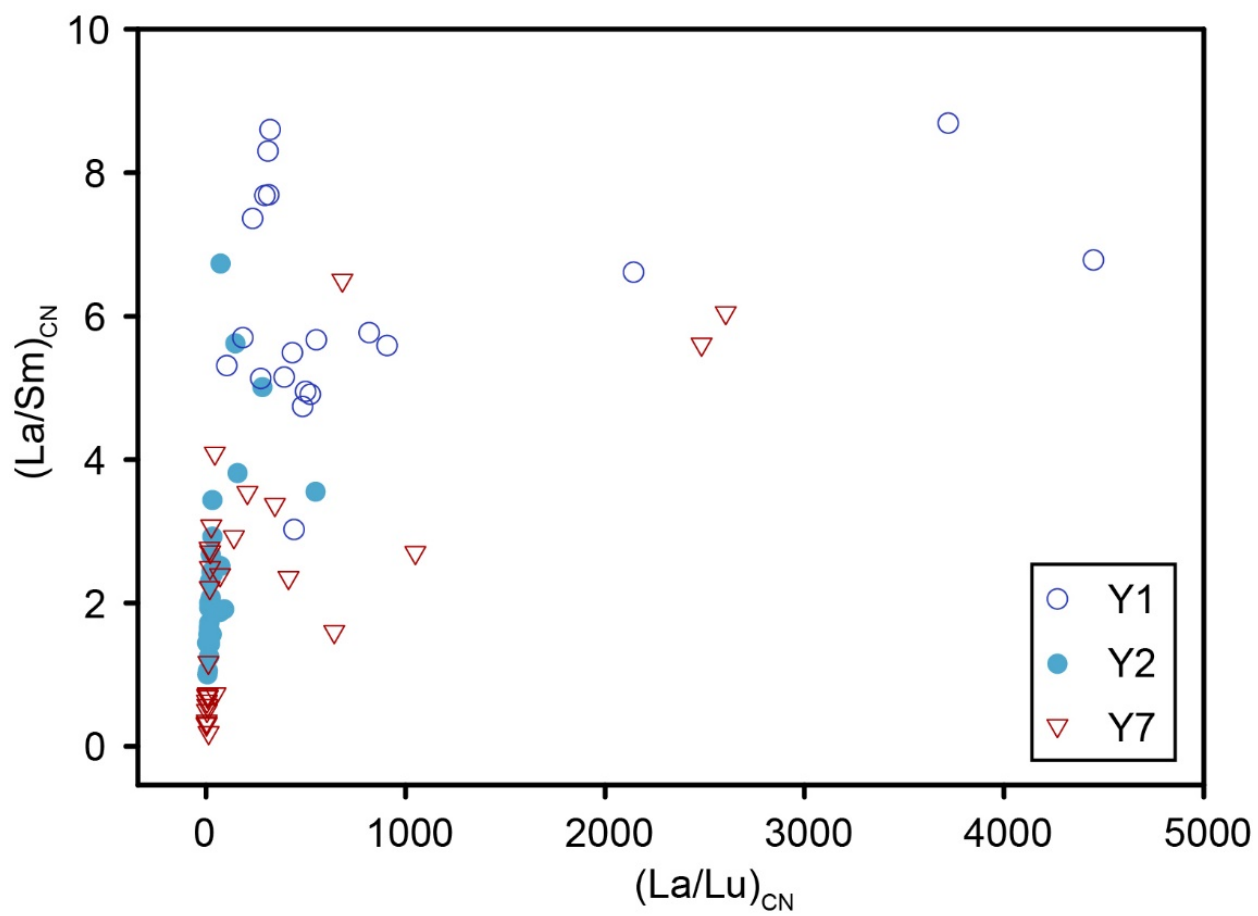


Figure S6. Chondrite normalized $(\text{La}/\text{Sm})_{\text{CN}}$ versus chondrite normalized $(\text{La}/\text{Lu})_{\text{CN}}$ plot for samples Y1, 2, and 7.

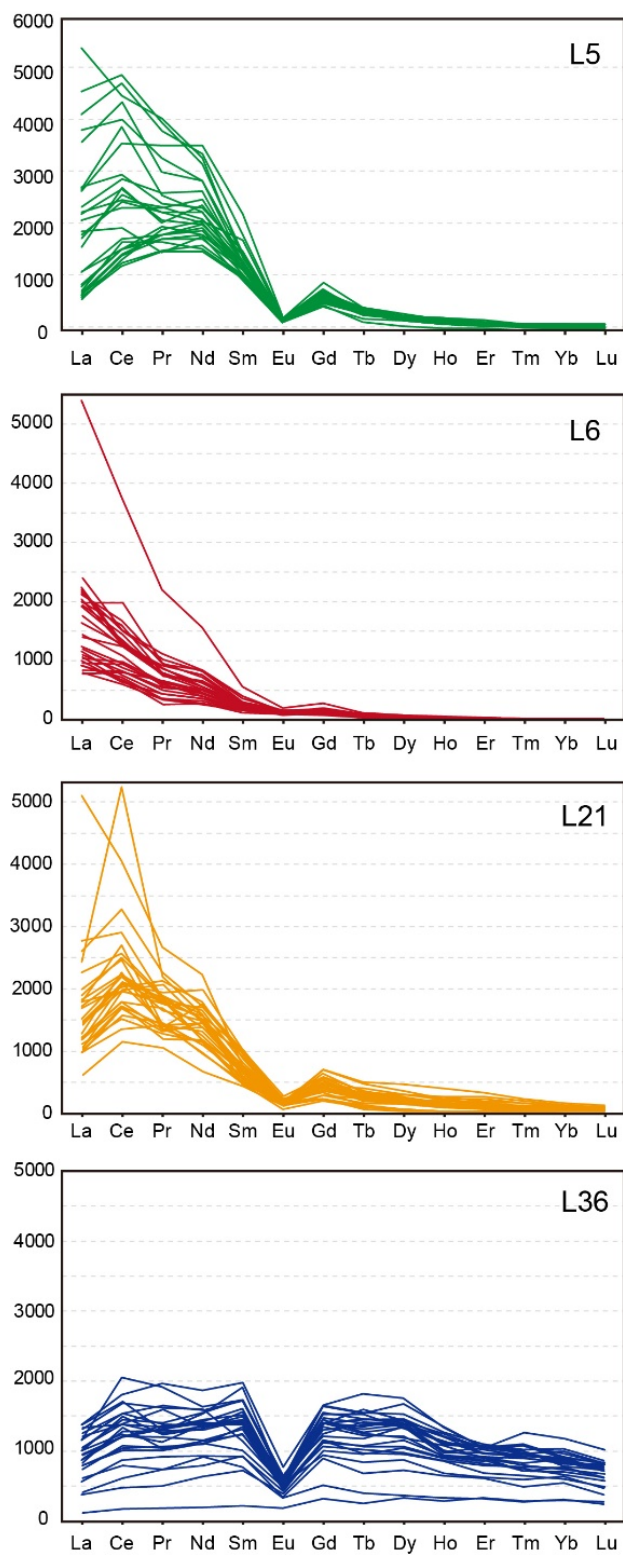
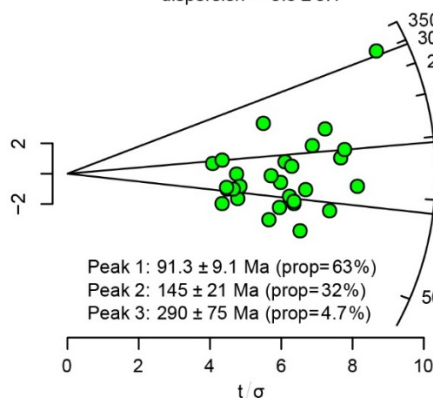


Figure S7. Chondrite normalized rare earth element (REE) pattern using the single apatite grain for each sample.

Sample Y12—Sunjiawan Formation

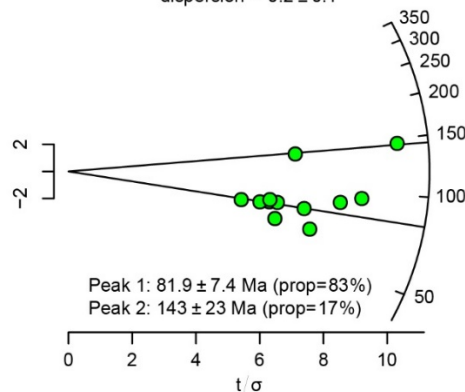
~1.8-1.5 Ga AUPb age component

Central age = 112 ± 15 Ma (n=28)
MSWD = 5.6, $p(\chi^2) = 0$
dispersion = 0.3 ± 0.1



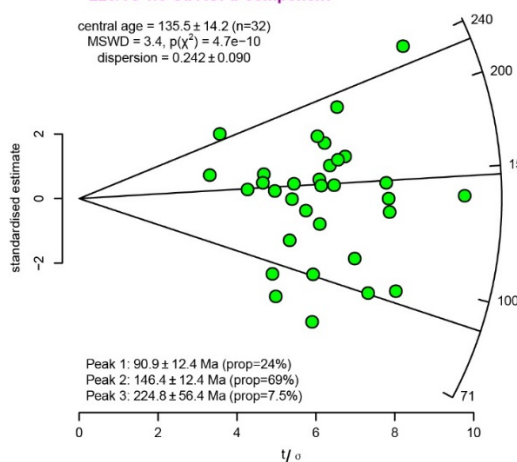
~138 Ma AUPb age component

Central age = 90 ± 13 Ma (n=12)
MSWD = 3.9, $p(\chi^2) = 1.1e-05$
dispersion = 0.2 ± 0.1



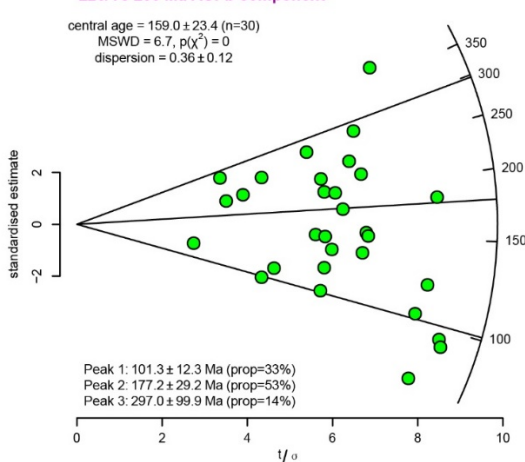
L26/Y8 1.6 Ga AUPb component

central age = 135.5 ± 14.2 (n=32)
MSWD = 3.4, $p(\chi^2) = 4.7e-10$
dispersion = 0.242 ± 0.090



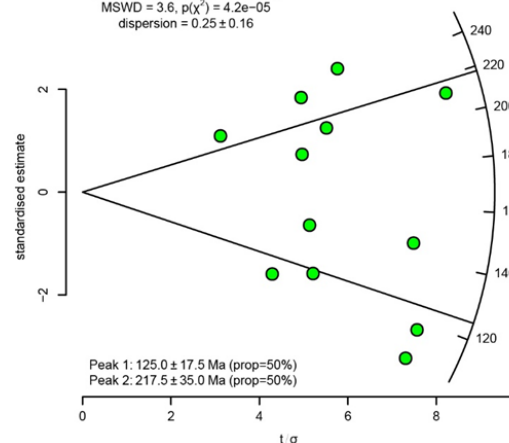
L26/Y8 250 Ma AUPb component

central age = 159.0 ± 23.4 (n=30)
MSWD = 6.7, $p(\chi^2) = 0$
dispersion = 0.36 ± 0.12



L29/Y9 1.7 Ga AUPb component

central age = 164.0 ± 29.6 (n=12)
MSWD = 3.6, $p(\chi^2) = 4.2e-05$
dispersion = 0.25 ± 0.16



L29/Y9 250 Ma AUPb component

central age = 146.7 ± 14.6 (n=37)
MSWD = 3.4, $p(\chi^2) = 3.3e-11$
dispersion = 0.251 ± 0.084

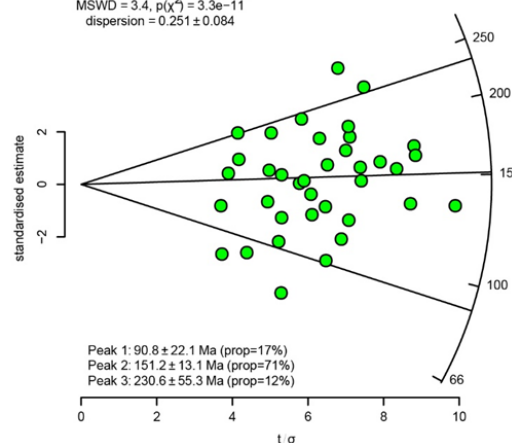


Figure S8. AFT radial plots from sample Y12, Y8, and Y9, deconvolved based on their apatite U-Pb ages.

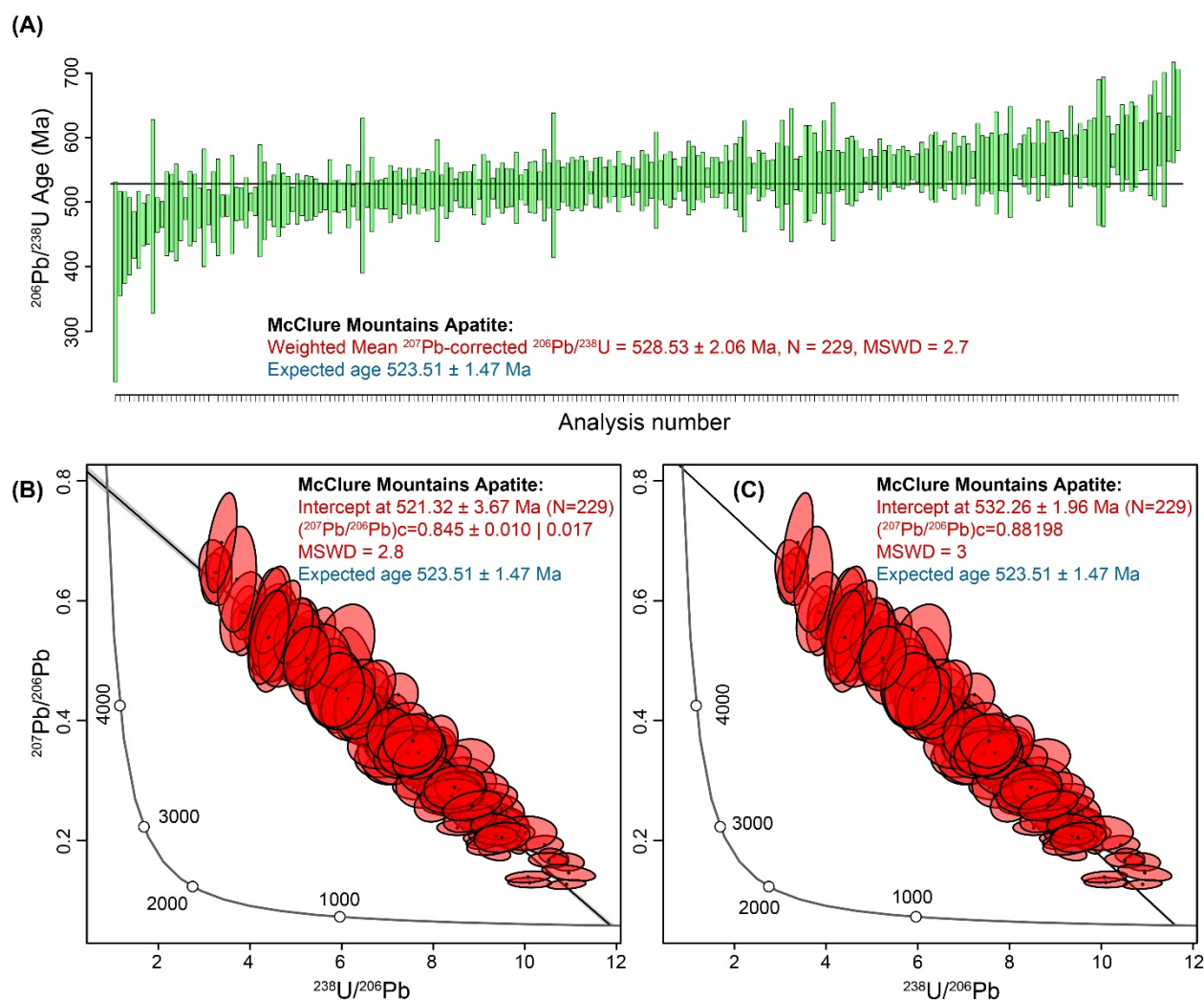


Figure S9. (A) The overall weighted mean (^{207}Pb corrected) $^{206}\text{Pb}/^{238}\text{U}$ ages and (B and C) AU-Pb Terra-Wasserburg concordia lower-intercept ages of McClure apatite grains (estimated to common Pb and anchored to common Pb using value of 0.88198), as the secondary reference material of apatite U-Pb age determination (229 analyses).

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