**Supplementary Document**

**WEST AFRICA IGNEOUS GEOCHRONOLOGY COMPILATION**

Figure 2, showing the age distribution of West African igneous ages, is largely based on the compilation by Grenholm and others (2019), with a few new entries from Morocco and Algeria. Most of the entries in our database (Table A1) are U-Pb or Pb-Pb ages from igneous zircons; a few 40Ar/39Ar igneous ages were also tabulated. Results obtained using the Rb/Sr and K/Ar methods were excluded. We have not included metamorphic ages, which can be found in Grenholm and others (2019). Each entry was ranked 1 to 3 as follows: 1 for igneous crystallization ages that are judged to be sufficiently accurate and precise to be plotted in the histogram and probability density curve in Figure 2; 2 for ages that would rate a "1" but are redundant; and 3 for ages that were not plotted because we judged them to be unreliable. For tectonic setting (column C) we have discriminated between the West African craton sensu stricto (WAC), the West African parautochthon (WAP), and Pan African orogens (PAO).

**STATISTICAL ANALYSIS**

The DZStats software package of Saylor and Sundell (2016) was used to assess the "sameness" of detrital zircon samples from the Taoudeni Basin that define the Assabet barcode, and other visually similar samples from elsewhere. Two metrics,PDP likeness and PDP cross-correlation coefficient are shown in Figure 10. Calculated results for other metrics are given in Table A3. It bears noting that the various samples were analyzed by different labs with different methods, the number of zircon ages varies markedly between samples, samples have a range of grain sizes and depositional environments, and the samples likely have a significant range of depositional ages. Although this is not an ideal suite for DZStats treatment, the results nonetheless show broad patterns that appear to be significant.

**SUPPLEMENTARY FIGURES**

**Figure S1**. Outcrop photograph of the Assabet El Hassiane Group, sample DB31.

**Figure S2**. Outcrop photograph of the Aïoun Group, sample CT70.

**Figure S3**. Outcrop photograph of the Khang Naam Group, sample CT72.

**Figure S4**. Outcrop photograph of the Jbéliat Group, sample DB29.

**Figure S5**. Outcrop photograph of the Jbéliat Group, sample CT73.

**Figure S6**. Outcrop photograph of the tillite that was assigned to the Jbéliat Group during PRISM geologic mapping, sample DB80.

**Figure S7**. Outcrop photograph of the Oujeft Group, Moudjeria Formation, sample CT60.

**Figure S8**. Outcrop photograph of the Oujeft Group, Aghaoujeft Formation, sample DB75.

**Figure S9**. Outcrop photograph of the Tichit Group, sample CT59.

**Figure S10**. Outcrop photograph of the Djonaba Group, sample DB76.

**Figure S11**. Outcrop photograph of the Gadel Group, sample DB66.

**Figure S12**. Outcrop photograph of the Gueneba Group, sample DB69.

**Figure S13**. Outcrop photograph of the Mseigguem Group, Ouechkech Formation, sample CT55.

**Figure S14**. Outcrop photograph of the El Ghabra Group, sample GB63.

**Figure S15**. Outcrop photograph of the El Fadra Group, sample DB62. This is typical of the sparse outcrop of the Mauritanide orogen. The remarkably clear map patterns in Google Earth images mostly reflect the distribution of distinctively colored bands of desert pavement and rubble crop.

**Figure S16**. Outcrop photograph of the OumachoueïmaGroup, Atilis Quartzite member, sample DB02.

**Figure S17.** Plots of zircon crystallization age (x axis) versus approximate depositional age (y axis) for all the detrital zircon samples in this study. (A) The upper plot shows Taoudeni Basin samples; (B) the lower plot shows Mauritanide samples. Red symbols show zircons having Th/U ratio greater than 0.1, of inferred igneous origin, with the larger symbols representing larger populations. Blue symbols show zircons having Th/U ratio less than 0.1, of inferred metamorphic origin. Ages from a single sample plot on a horizontal line and age populations are represented by tight clusters of points. Depositional ages are based on stratigraphic age assignments, which take into account zircon-based maximum depostional ages (Table 1). Data from some samples overlap because assigned depositional ages are identical or nearly so.

**SUPPLEMENTARY TABLES**

**Table S1.** Igneous U-Pb ages from West Africa used to construct Figure 2. Most of the entries are from the compilation by Grenholm and others (2019). References are included below. Compilation was completed in December, 2021.

**Table S2.** LAICPMS U-Pb analytical data for detrital zircons from the El Hneikat Formation, sample DB63.

**Table S3.** Statistical comparisons between all Assabet-like samples and each other, and also with the Assabet composite barcode, calculated using DZStats software of Saylor and Sundell (2016). Two metrics of "sameness", PDP likeness and PDP cross-correlation coefficient, are shown in figure 10. Additional metrics are provided here.

**Table S4.** Summary information for Assabet-like DZ samples from Mauritania and elsewhere.

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