Corrigendum to Geochronology, 3, 247–257, 2021
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Corrigendum to
"On the treatment of discordant detrital zircon U–Pb data" published in Geochronology, 3, 247–257, 2021

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Vermeesch (2021) incorrectly defines the Aitchison distance as the Euclidean distance in additive logratio space. The correct definition should be expressed in centred or isometric logratio coordinates (Aitchison, 1986; Egozcue et al., 2003; Vermeesch, 2013; Vermeesch and Garzanti, 2015). The additive logratio transformation is asymmetric in the parts of its composition (i.e., ^{206}Pb, ^{207}Pb and ^{238}U). Due to this asymmetry, the space of additive logratio coordinates (e.g., $\ln[^{207}\mathrm{Pb}/^{206}\mathrm{Pb}]$ vs. $\ln[^{238}\mathrm{U}/^{206}\mathrm{Pb}]$) does not define an orthonormal basis. It is therefore not possible to measure angles or Euclidean distances in additive logratio space. The issue can be fixed by changing the axis labels of Fig. 6 in terms of isometric logratio coordinates (Egozcue et al., 2003):

$$\begin{cases} x = \frac{1}{\sqrt{2}} \ln\left[\frac{^{238}\mathrm{U}}{^{206}\mathrm{Pb}}\right], \\ y = \frac{1}{\sqrt{6}} \ln\left[\frac{^{207}\mathrm{Pb}^2}{^{206}\mathrm{Pb} \cdot ^{238}\mathrm{U}}\right]. \end{cases}$$

Using this change of variables, Eq. (7) of the paper can be recast as follows:

$$\begin{aligned} \mathrm{d}x(t) &= \tfrac{1}{\sqrt{2}}(\ln[r_{86}] + \ln[R_{68}(t)]) \quad \text{and} \\ \mathrm{d}y(t) &= \sqrt{\frac{2}{3}}\left(\ln[r_{76}] - \ln\left[\frac{R_{58} \cdot R_{75}(t)}{R_{68}(t)}\right]\right), \end{aligned} \tag{7}$$

which is identical to the original expression except for the $1/\sqrt{2}$ and $\sqrt{2/3}$ multipliers. These multipliers result in a rescaling of the d_a and d_c discordance filters. See the revised version of conversion Table 1 for the effect of this rescaling. The effect of the corrected algorithm on the shape of the discordance envelope is minor (Fig. 1). Therefore, the new definitions will not have any noticeable effect on published results. The new definitions have been implemented in `IsoplotR` (version 5.5; Vermeesch, 2018), and the default settings for the d_a and d_c cutoffs have been changed accordingly.

Table 1. Revised conversion table for the five discordance filters of Vermeesch (2021); d_a and d_c have been rescaled using the correct Aitchison geometry.

d_r	d_t	d_{sk}	d_a	d_c
−10	−71	−0.59	−2.3	−3.0
−5	−48	−0.36	−1.6	−2.0
−4	−41	−0.30	−1.4	−1.7
−3	−34	−0.24	−1.1	−1.4
−2	−25	−0.16	−0.83	−1.1
−1	−14	−0.08	−0.45	−0.58
0	0	0	0	0
1	14	0.08	0.47	0.60
2	28	0.16	0.91	1.2
3	40	0.23	1.3	1.6
4	49	0.29	1.6	2.0
5	58	0.35	1.9	2.4
10	97	0.62	3.2	3.9
15	140	0.96	4.7	5.8
20	190	1.4	6.3	7.9
25	250	1.8	8.3	10
30	320	2.4	11	14
40	490	3.6	16	21
50	700	5.2	23	30

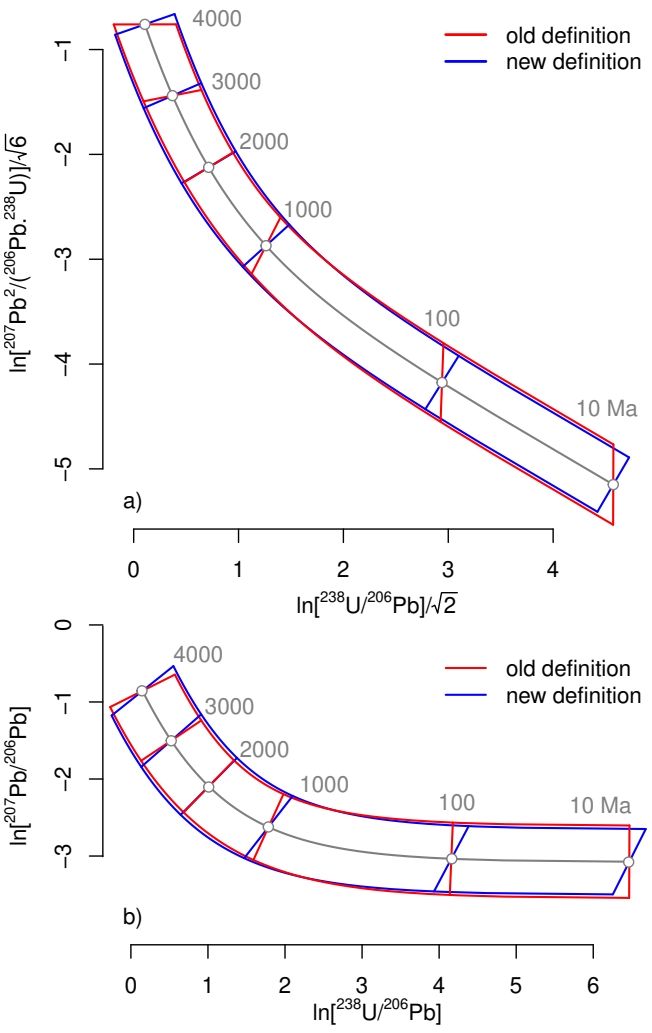

Figure 1. Discordance envelopes (similar to Fig. 3 of Vermeesch, 2021) for the perpendicular Aitchison distance (d_a) using the old definition (red, drawn at concordia ±47 %) and the new definition (blue, drawn at concordia ±30 %), shown **(a)** in isometric logratio coordinates and **(b)** in additive logratio coordinates. The shapes of the two envelopes are similar, which means that the incorrectness of the original definition has only a minor effect on the filtered results.

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