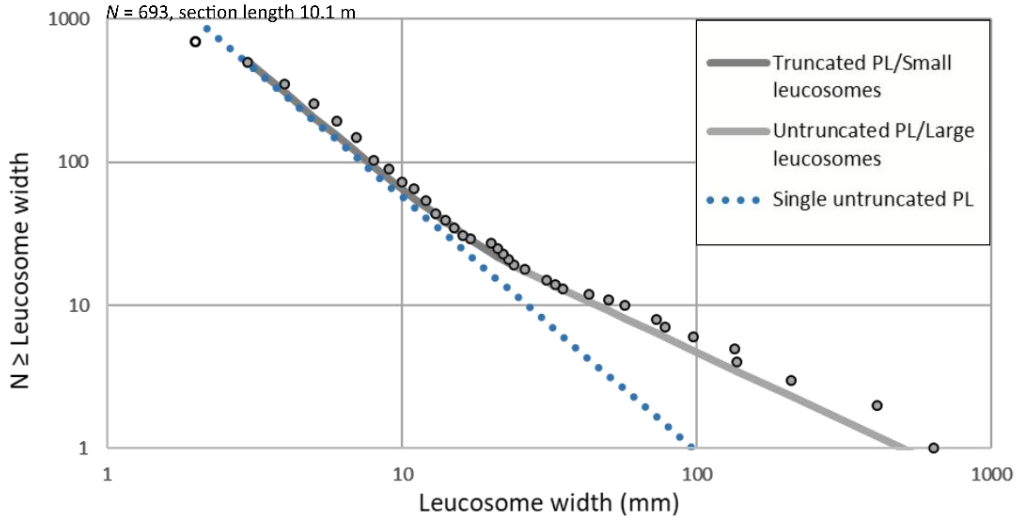
Supplementary material for manuscript "Double Power-Law in Leucosome Width Distribution: Implications for Recognizing Melt Movement in Migmatites" by Saukko *et al.*

The supplementary material for this article contains additional diagrams that illustrate the fitting of power-law distributions on the measured leucosome width data, and further examples of our numerical modelling.

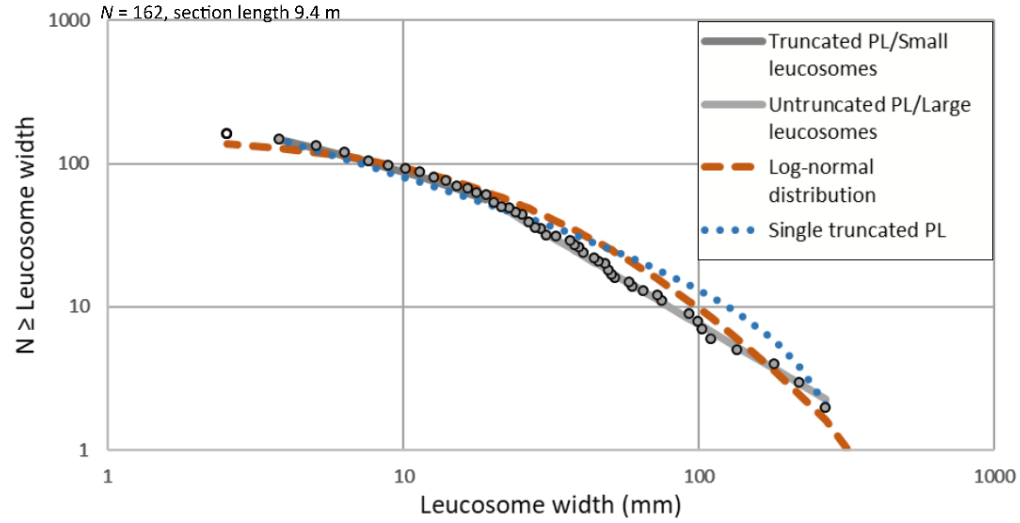
1 Power-law and lognormal distribution fits on measured data

The main manuscript shows the power-law fits we considered most accurate for each of the measured migmatite sections. For comparison, we show here the other distribution types considered and fitted for the data: single and double power-laws, and log-normal distributions.

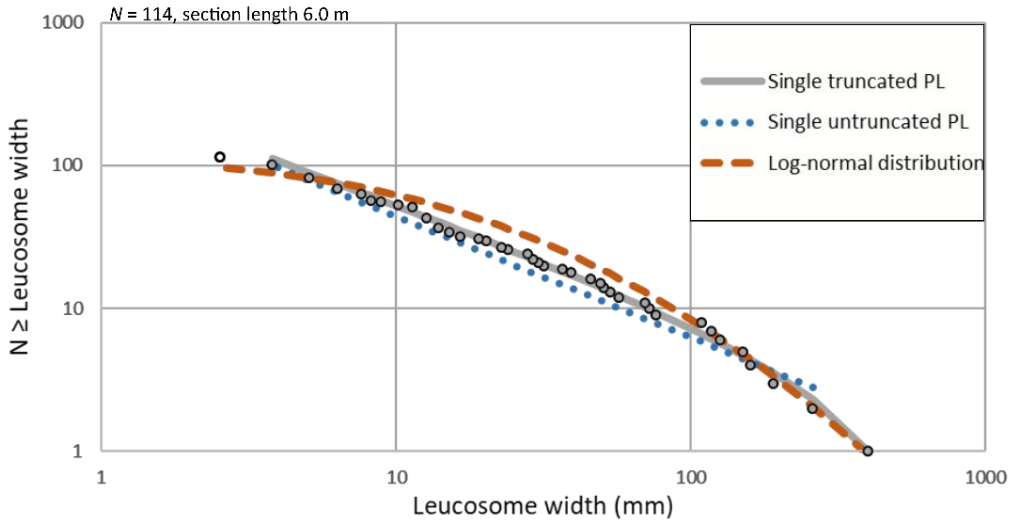
A



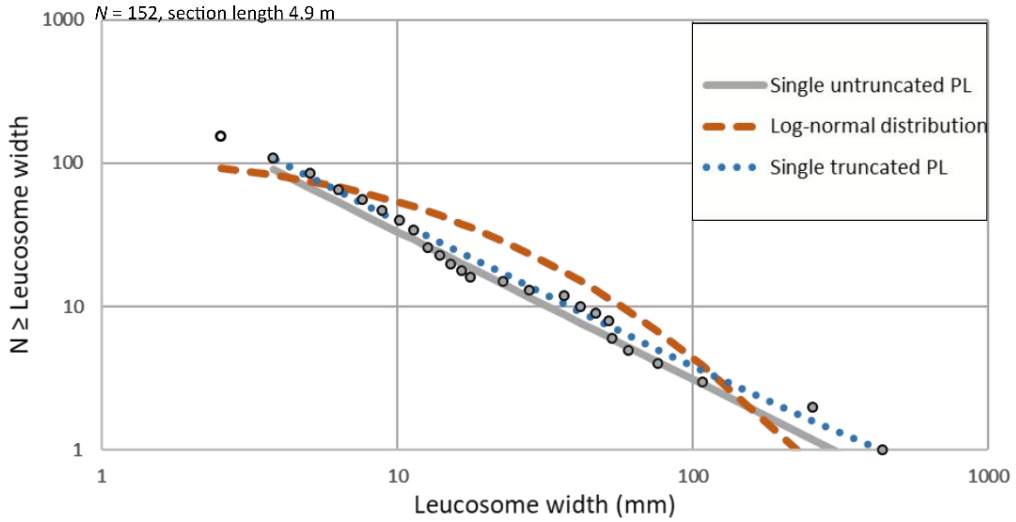
B



C



D



The solid lines in the graphs indicate the distributions used in the manuscript, whereas the dashed lines indicate distributions that fit more poorly. No log-normal distribution has been fitted for section A, as the general concave shape of a log-normal distribution is a poor fit with the convex curve of the width measurements.

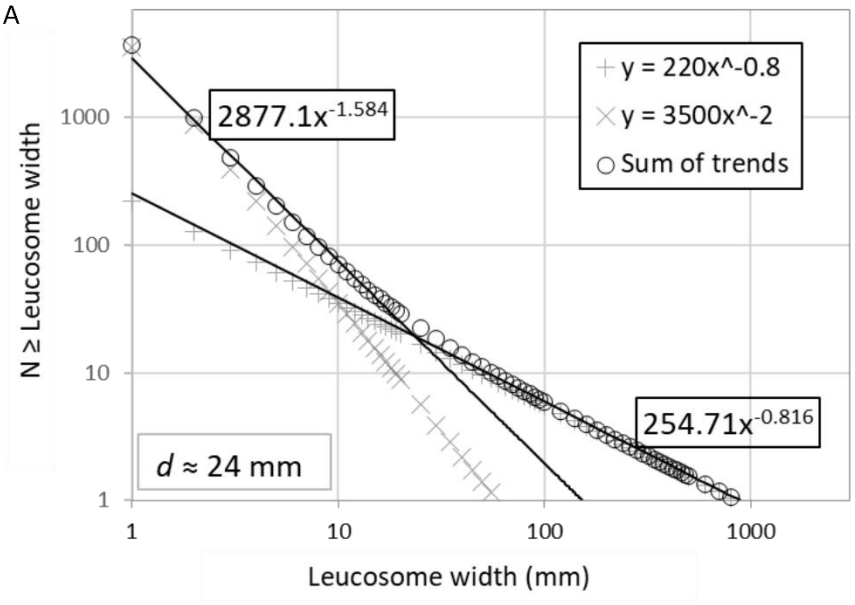
Section D is a good fit with both truncated and untruncated power-law. It is expected that a truncated power-law will always give a better fit, simply because it has an additional free parameter (Deluca and Corral 2013). As the fits are almost equally good, we chose to use the untruncated fit, because it contains fewer free parameters (see the table below).

The table below shows the Kolmogorov-Smirnov (KS) statistic calculated for the cumulative probability distribution of all fits. A smaller value corresponds to a better fit. The highlighted value is the best fit for each site and the fit reported in the article.

	Double PL	**Truncated PL**	**Untruncated PL**	**Log-normal distribution**
Section A	0.097		0.12	
Section B	0.049	0.094		1.00
Section C		0.084	0.11	0.22
Section D		0.055	0.062	0.32

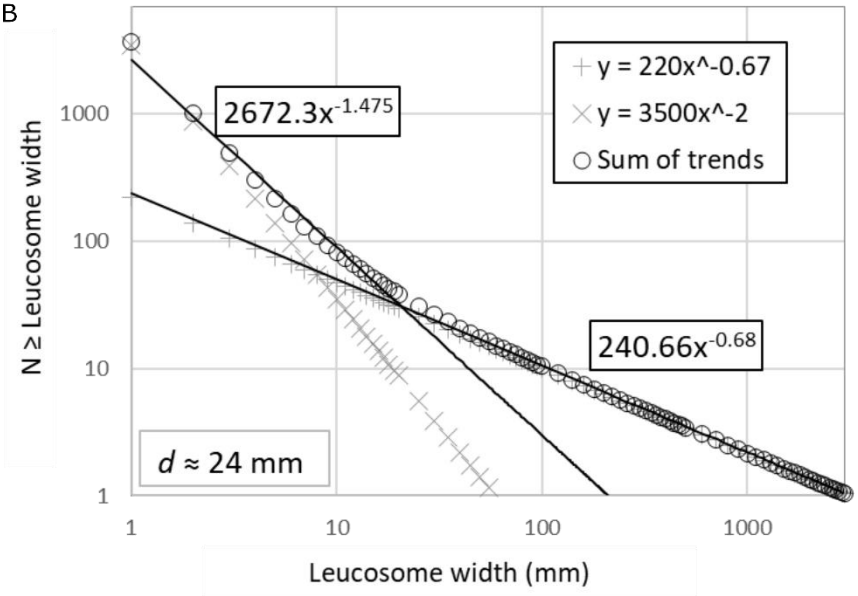
2 Synthetic distributions

A



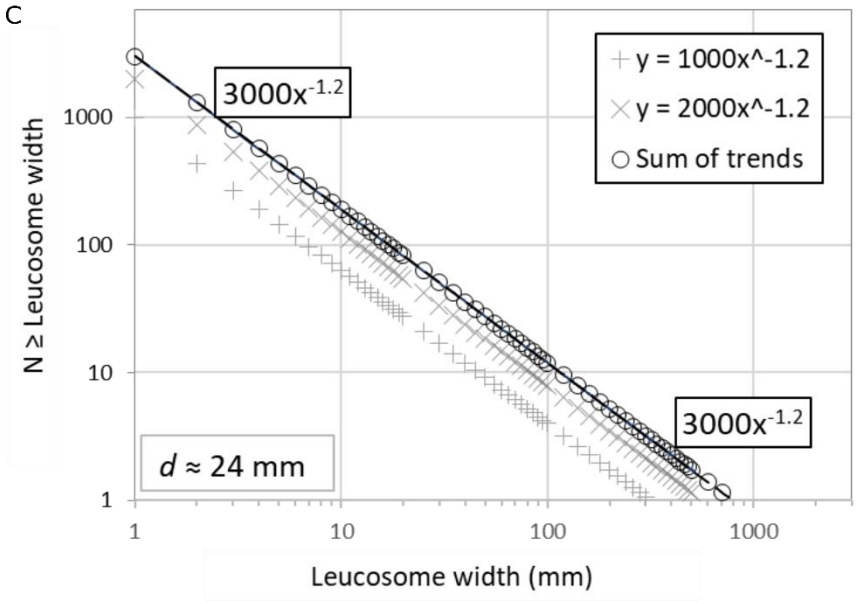
A. As also shown in the main text, a leucosome width distribution pattern similar to the measured outcrop section can be produced when two leucosome width distributions interfere, if one of the distributions has relatively high m and the other relatively low m, and the total amount of leucosomes k on the trend with the low m value is significantly smaller than on the trend with the high m value.

B



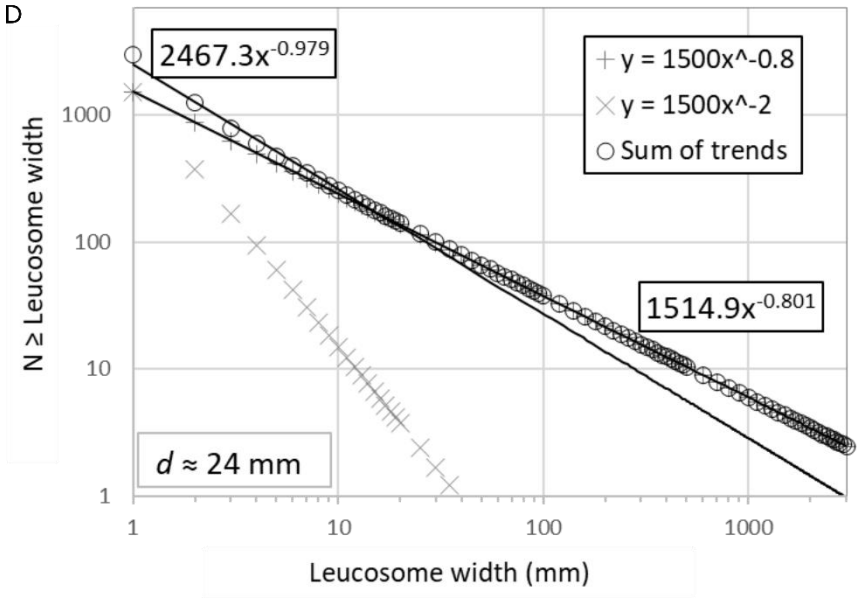
B. Increasing the difference of the exponents m from case makes the kink more pronounced.

C



C. Similar m values on the two distributions result in a kink-free distribution pattern, where the original m value is preserved on the resulting distribution.

D



D. If k, the total amount of leucosomes equal to or larger than the unit size, is similar on both trends, the kink will be hard to distinguish on the resulting composite distribution even when the m values are very different.