

Figure S1

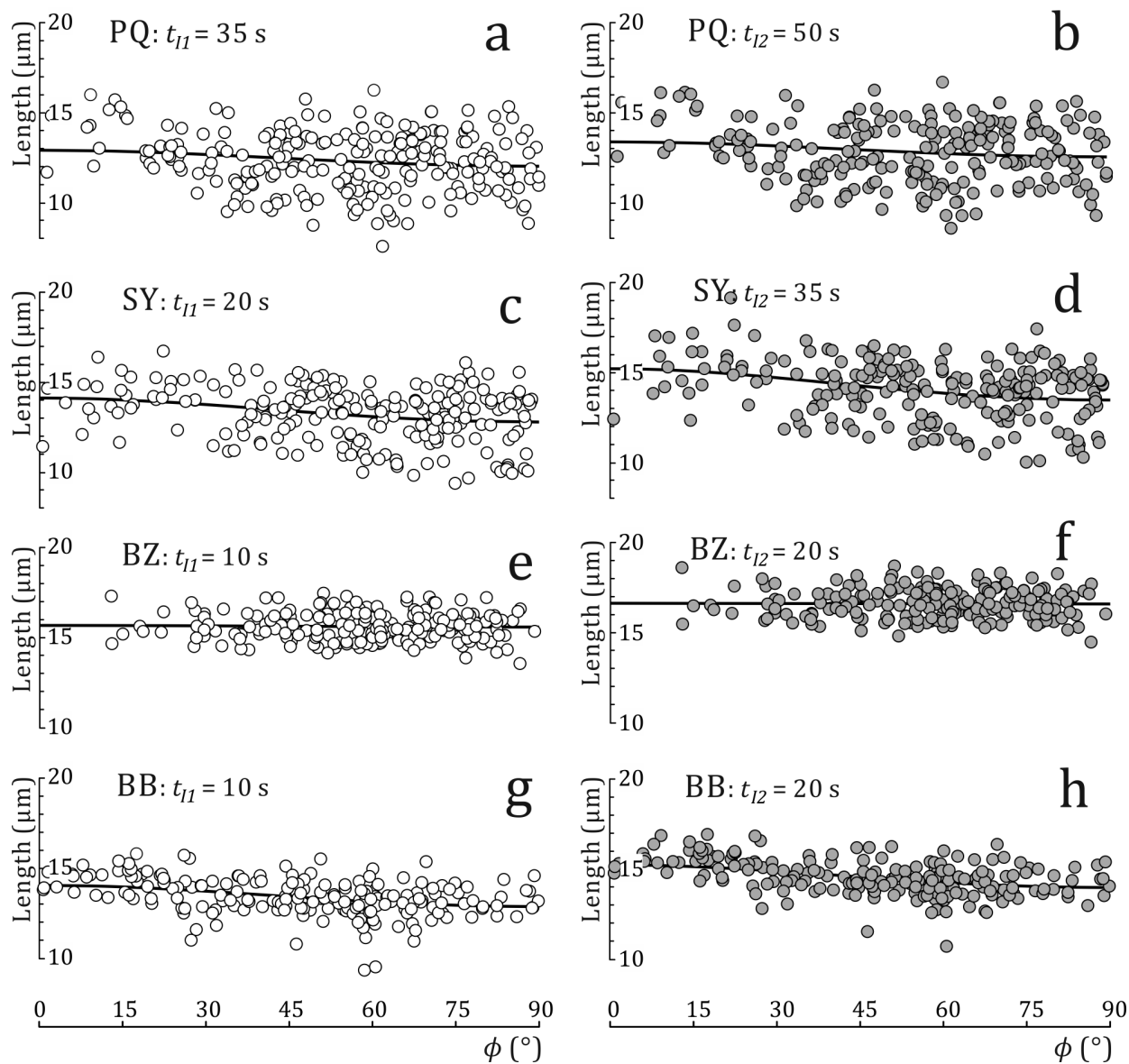


FIGURE S1. Lengths of fossil confined tracks in the studied apatites measured after the first (t_{I1}) and second immersion (t_{I2}) in 5.5 M HNO_3 at 21 $^\circ\text{C}$, plotted against angle to the c -axis. PQ: Panasqueira ((a): $t_{I1} = 35$ s, (b): $t_{I2} = 50$ s); SY: Slyudyanka ((c): $t_{I1} = 20$ s, (d): $t_{I2} = 35$ s); BZ: Brazil ((e): $t_{I1} = 10$ s, (f): $t_{I2} = 20$ s); BB: Bamble ((g): $t_{I1} = 10$ s, (h): $t_{I2} = 20$ s).

Figure S2

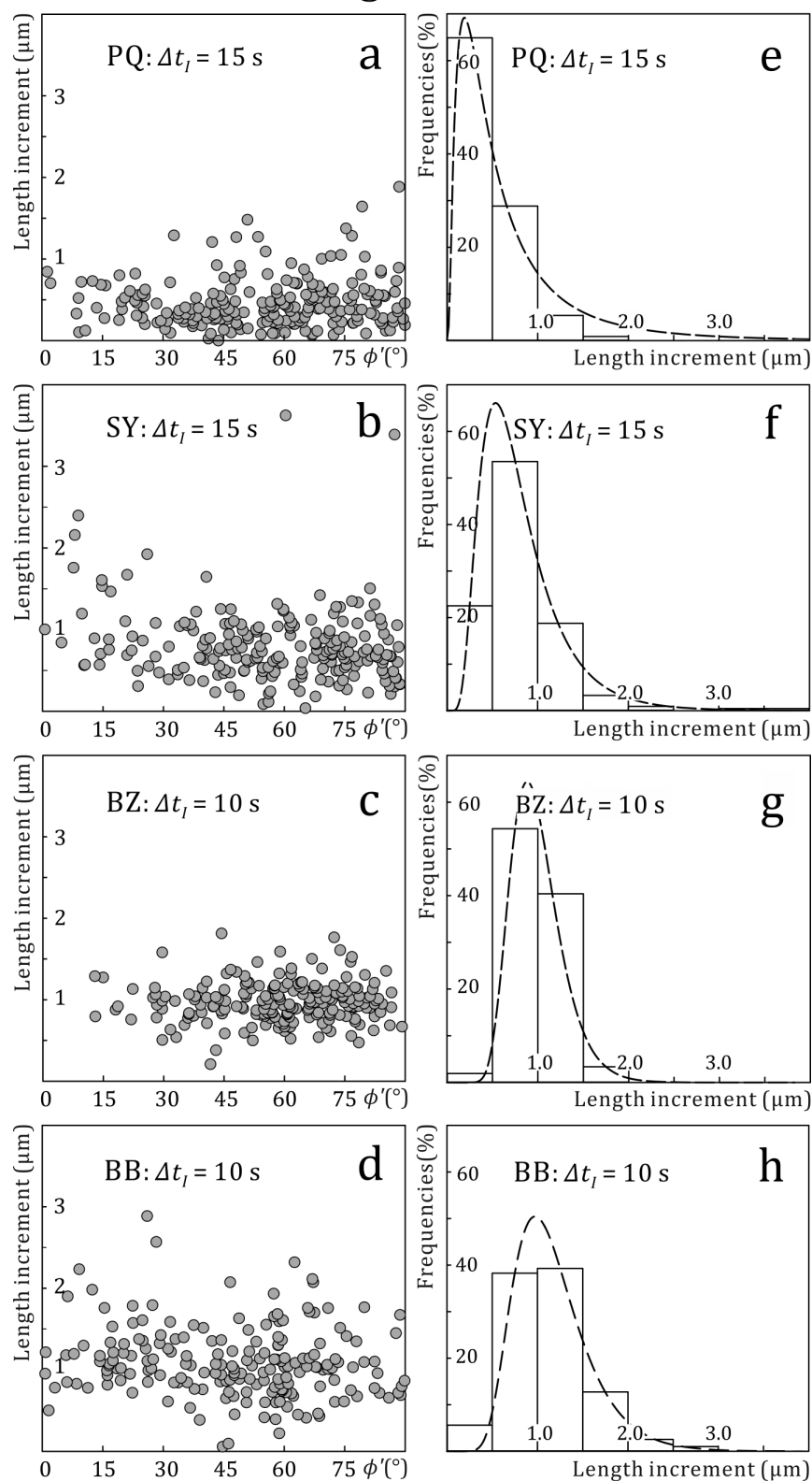


FIGURE S2. Track length increments (Δl) during the etch time increment (Δt_l) from the first to the second immersion in 5.5 M HNO_3 at 21 °C, plotted against angle to the c-axis (ϕ), and corresponding frequency distributions of Δl in the studied samples. PQ: Panasqueira; SY: Slyudyanka; BZ: Brazil; BB: Bamble. PQ ((a) and (e); $\Delta t_l = 15$ s); SY ((b) and (f); $\Delta t_l = 15$ s); BZ ((c) and (g); $\Delta t_l = 10$ s); BB ((d) and (h); $\Delta t_l = 10$ s); the dashed lines in (e)-(h) represent polynomial fits.

Figure S3

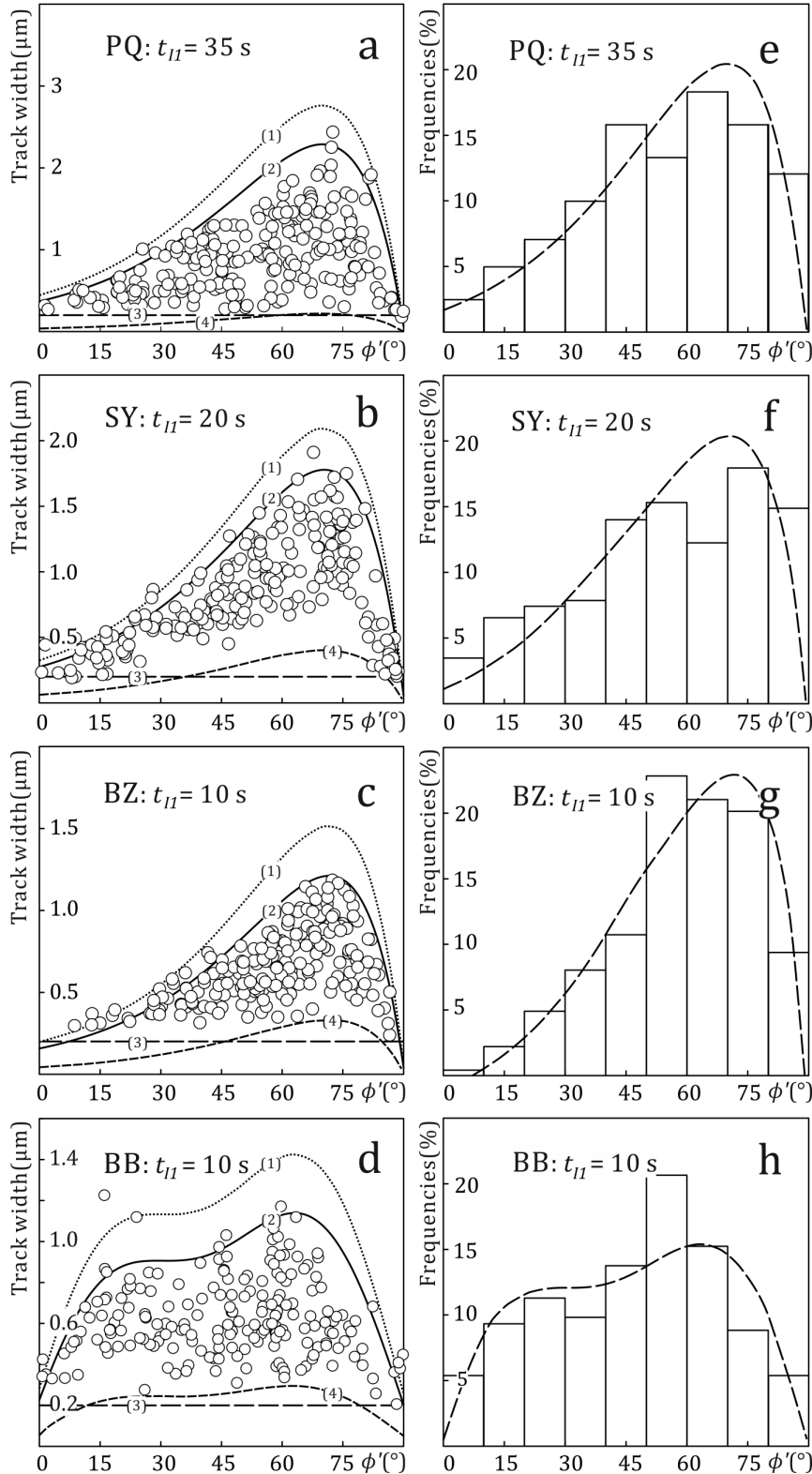


FIGURE S3. Confined track widths (r_0) after the first immersion in 5.5 M HNO_3 at 21 $^{\circ}\text{C}$ plotted against angle to the c -axis (ϕ), and corresponding angular distributions. PQ: Panasqueira; SY: Slyudyanka; BZ: Brazil; BB: Bamble. PQ ((a) and (e)); SY ((b) and (f)); BZ ((c) and (g)); BB ((d) and (h)). The lines (1)-(4) in (a)-(d) are inferred etching and selection biases; (1) theoretical maximum width: $v_R(\phi') \times t_i$; (2) width assuming an average access time t_A to reach the confined track: $v_R(\phi') \times (t_i - t_A)$; (3) threshold width of tracks judged suitable for measurement; (4) minimum width at the host track intersection of tracks etched to both ends (equation 4). The long-dashed lines superimposed on the angular distributions (e)-(h) show the range of track widths r_0 constrained by criteria (2)-(4) as a function of ϕ .

Figure S4

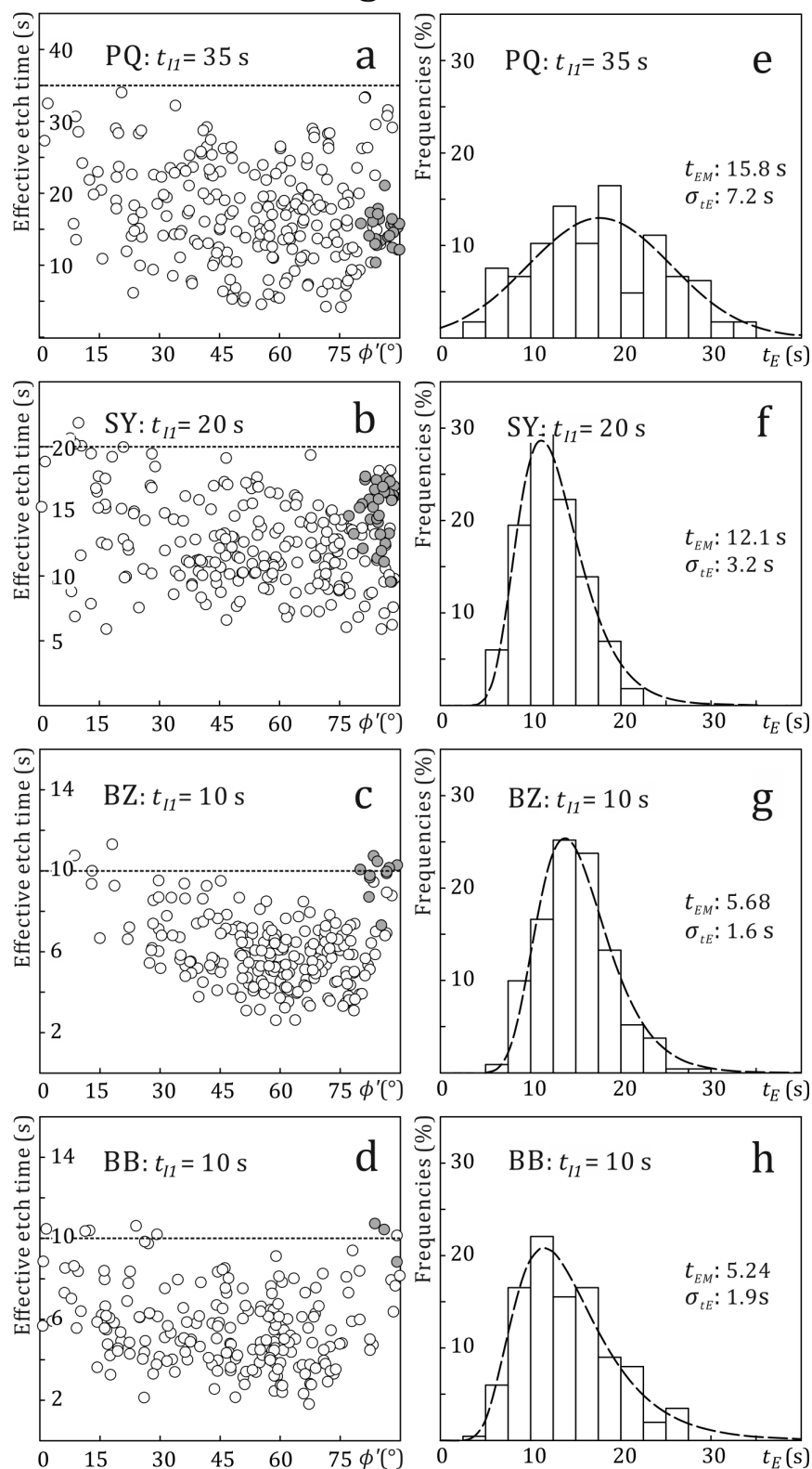


FIGURE S4. Effective etch times (t_E) of confined tracks plotted against their angles to the c -axis (ϕ) and corresponding t_E -distributions. PQ: Panasqueira; SY: Slyudyanka; BZ: Brazil; BB: Bamble. PQ ((a) and (e)); SY ((b) and (f)); BZ ((c) and (g)); BB ((d) and (h)). Open symbols in (a)-(d): measured using equation 4a (Figure 1a-c); filled symbols: measured using equation 4b (Figure 1d). The dashed lines in (e)-(h) represent polynomial fits. t_{EM} and σ_{tE} : geometric means and standard deviations of the effective etch-time distributions.

Figure S5

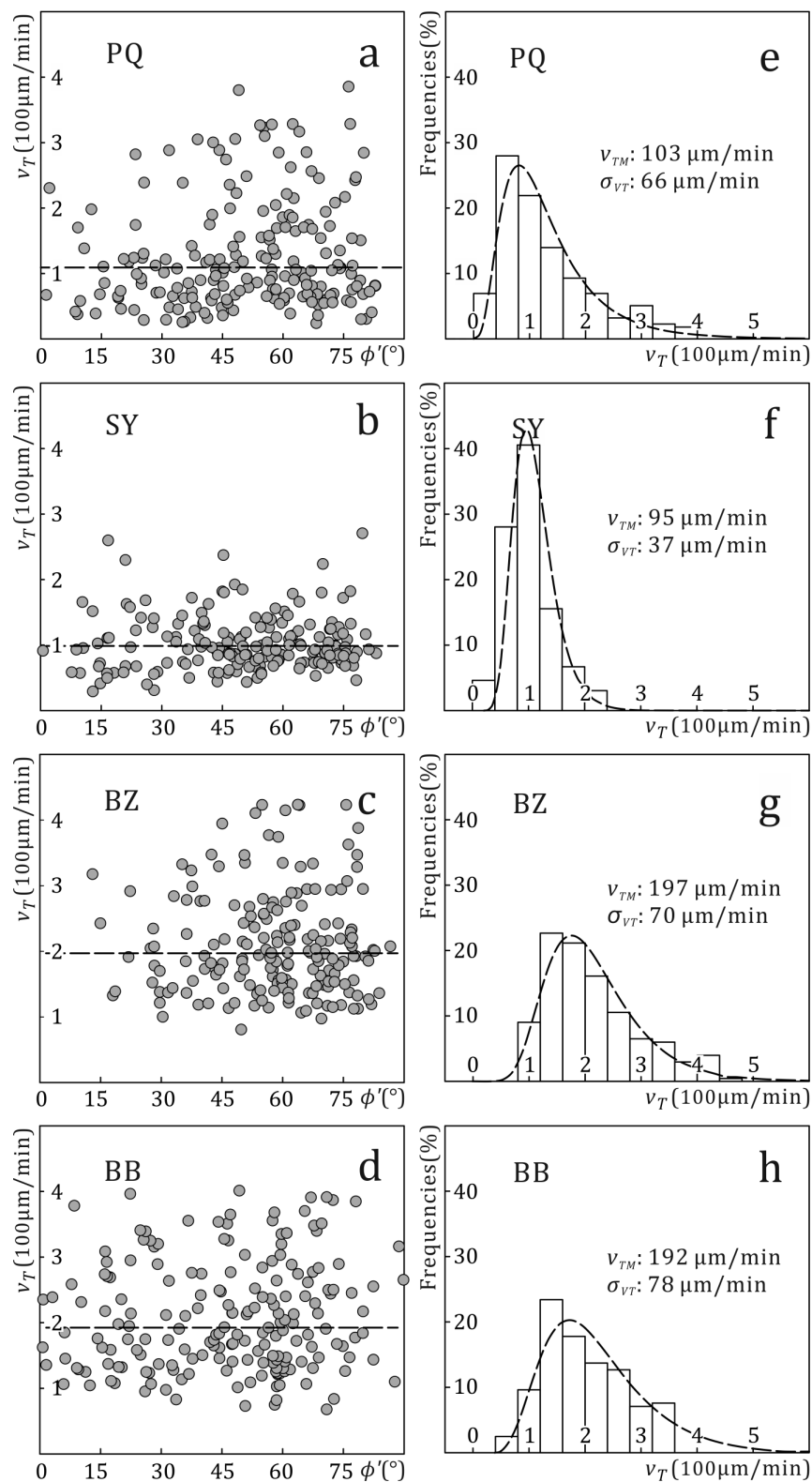


FIGURE S5. Etch rates (v_T) of confined tracks plotted against their angles to the c -axis (ϕ), and corresponding v_T distributions. PQ: Panasqueira; SY: Slyudyanka; BZ: Brazil; BB: Bamble. PQ ((a) and (e)); SY ((b) and (f)); BZ ((c) and (g)); BB ((d) and (h)). The dashed lines in (e)–(h) represent polynomial fits. v_{TM} and σ_{vT} : geometric means and standard deviations of the track etch-rate distributions.

Figure S6

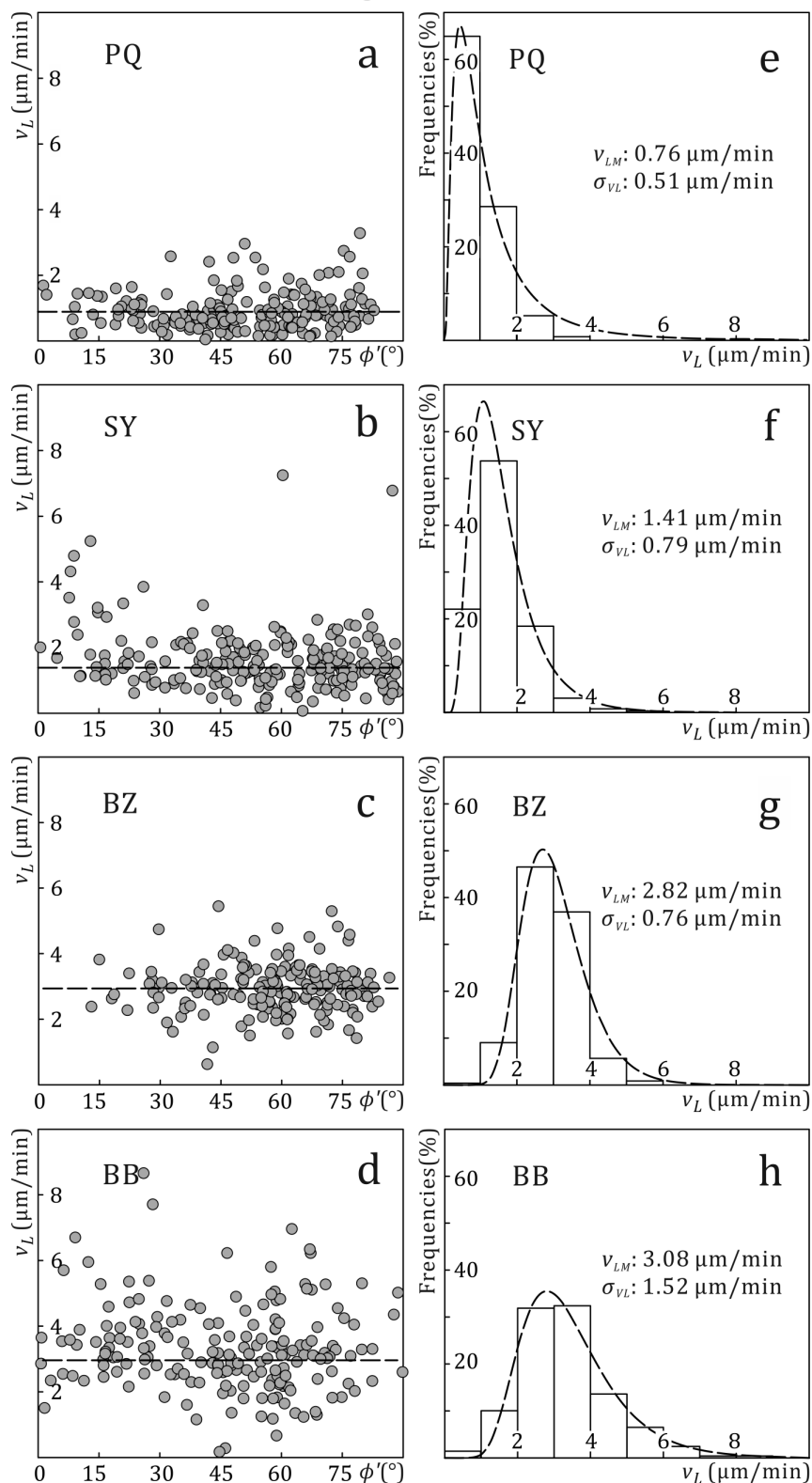


FIGURE S6. Rates of length increase (v_L) of confined tracks plotted against their angles to the c -axis (ϕ) and corresponding v_L -distributions. PQ: Panasqueira; SY: Slyudyanka; BZ: Brazil; BB: Bamble. PQ ((a) and (e)); SY ((b) and (f)); BZ ((c) and (g)); BB ((d) and (h)); the dashed lines in (e)-(h) represent polynomial fits. v_{LM} and σ_{vL} : means and standard deviations of the distributions of the rate of length increase.