On some factors controlling fission-track etch rates in apatite

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Supplements

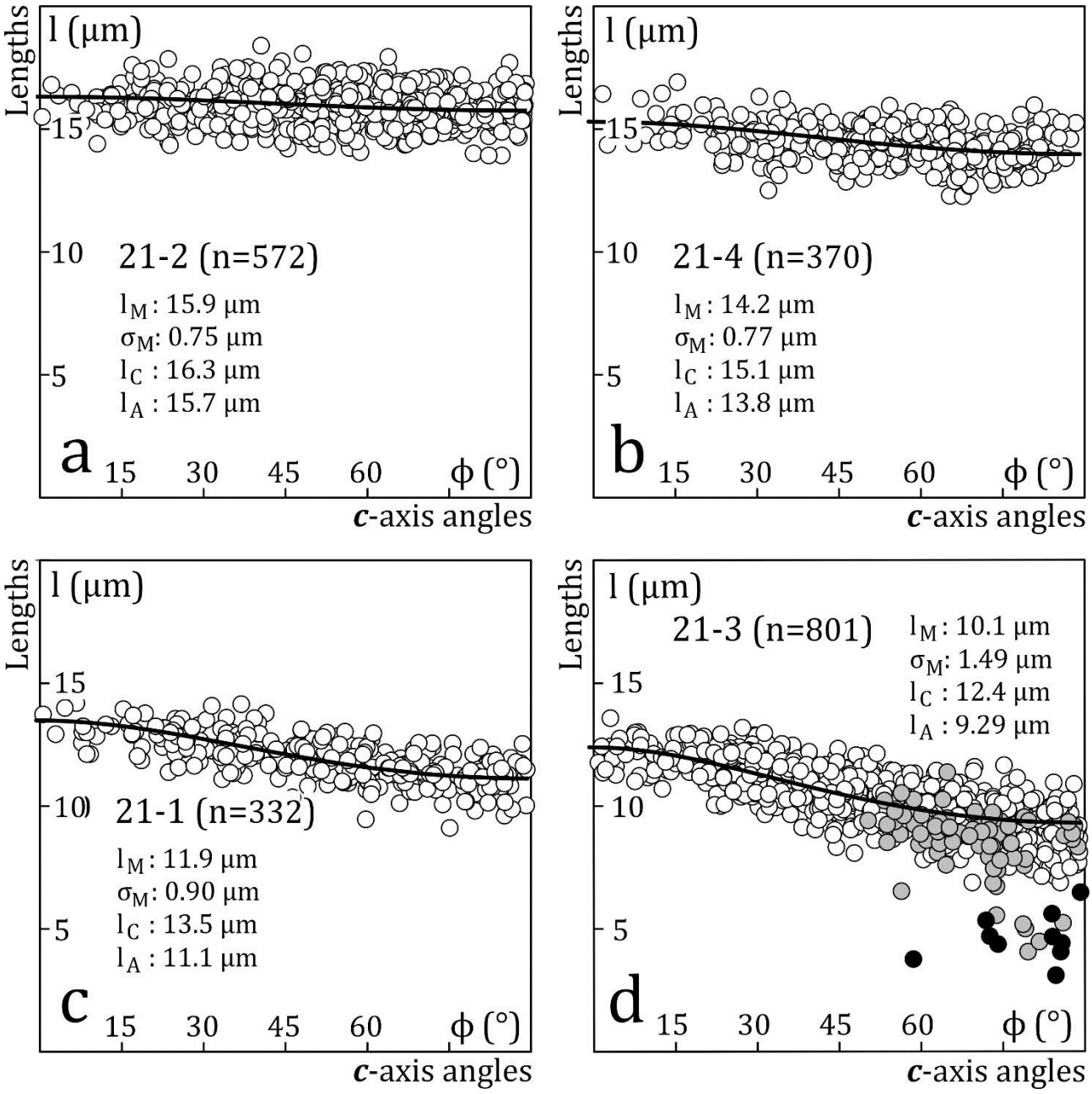

Figure S01. Measured lengths of induced horizontal confined tracks in the four investigated samples plotted against their **c**-axis angles: (**a**): unannealed; (**b**): annealed 10 h at 240 °C; (**c**): 288 °C; (**d**) 310 °C (Ketcham et al., 2015). White circles: continuous tracks; grey circles: stepped tracks; black circles: gapped tracks. The solid lines are ellipses fitted to the data; l_M: mean track length; s_M: standard deviation of the track length distribution; l_C: ***c***-axis intercept of ellipse; l_A: ***a***-axis intercept.

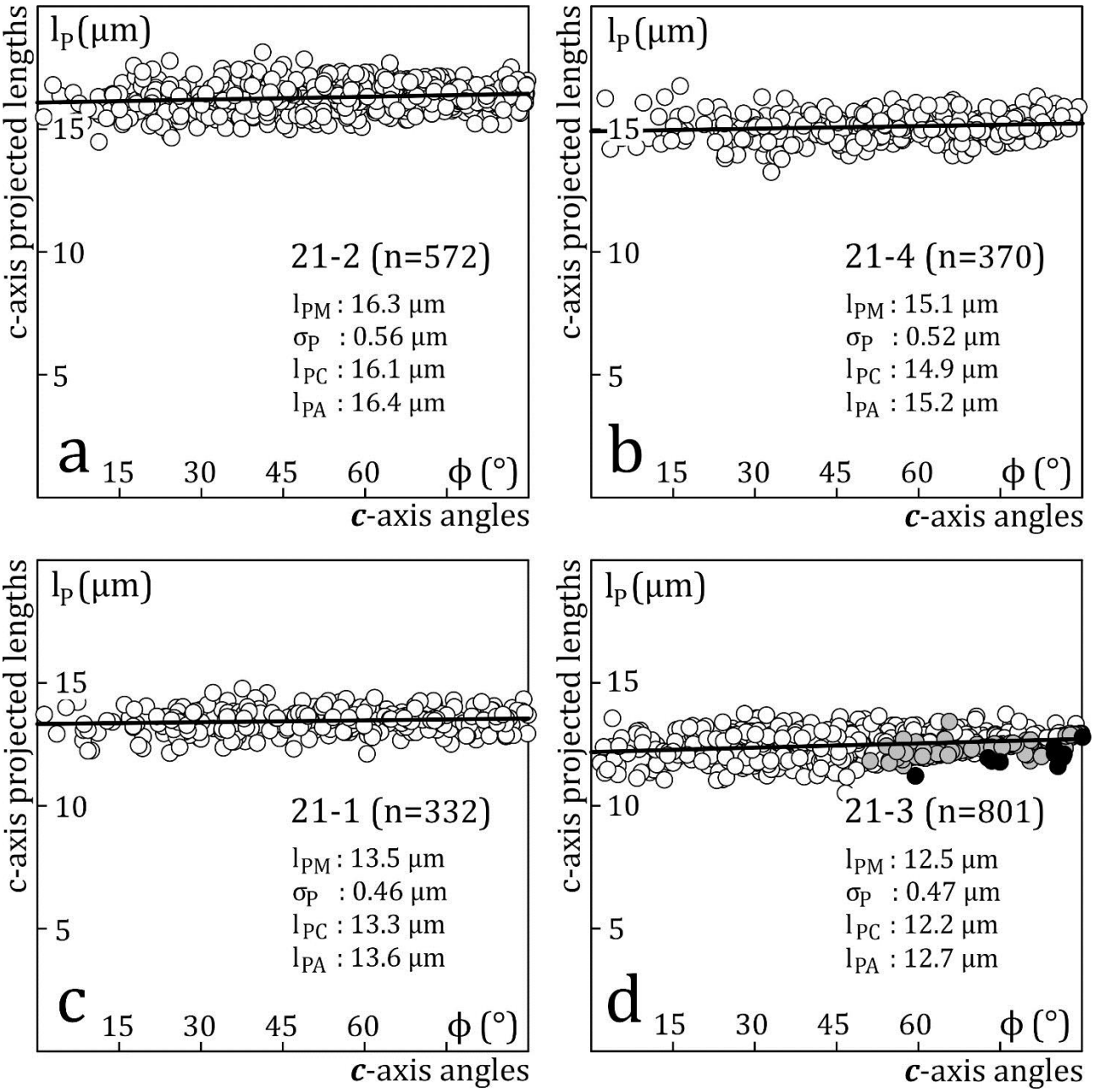

Figure S02. ***c***-axis-projected lengths of induced horizontal confined tracks in the four investigated samples, plotted against their true ***c***-axis angles: (**a**): unannealed; (**b**): annealed 10 h at 240 °C; (**c**): 288 °C; (**d**): annealed 10 h at 310 °C (Ketcham et al., 2015). White circles: continuous tracks; grey circles: stepped tracks; black circles: gapped tracks. The solid lines are linear regression lines; l_{PM}: mean ***c***-axis-projected track length; s_{PM}: standard deviation of the ***c***-axis-projected track lengths; l_{PC}: ***c***-axis intercept of the fitted regression line; l_{PA}: ***a***-axis intercept of the fitted regression line.

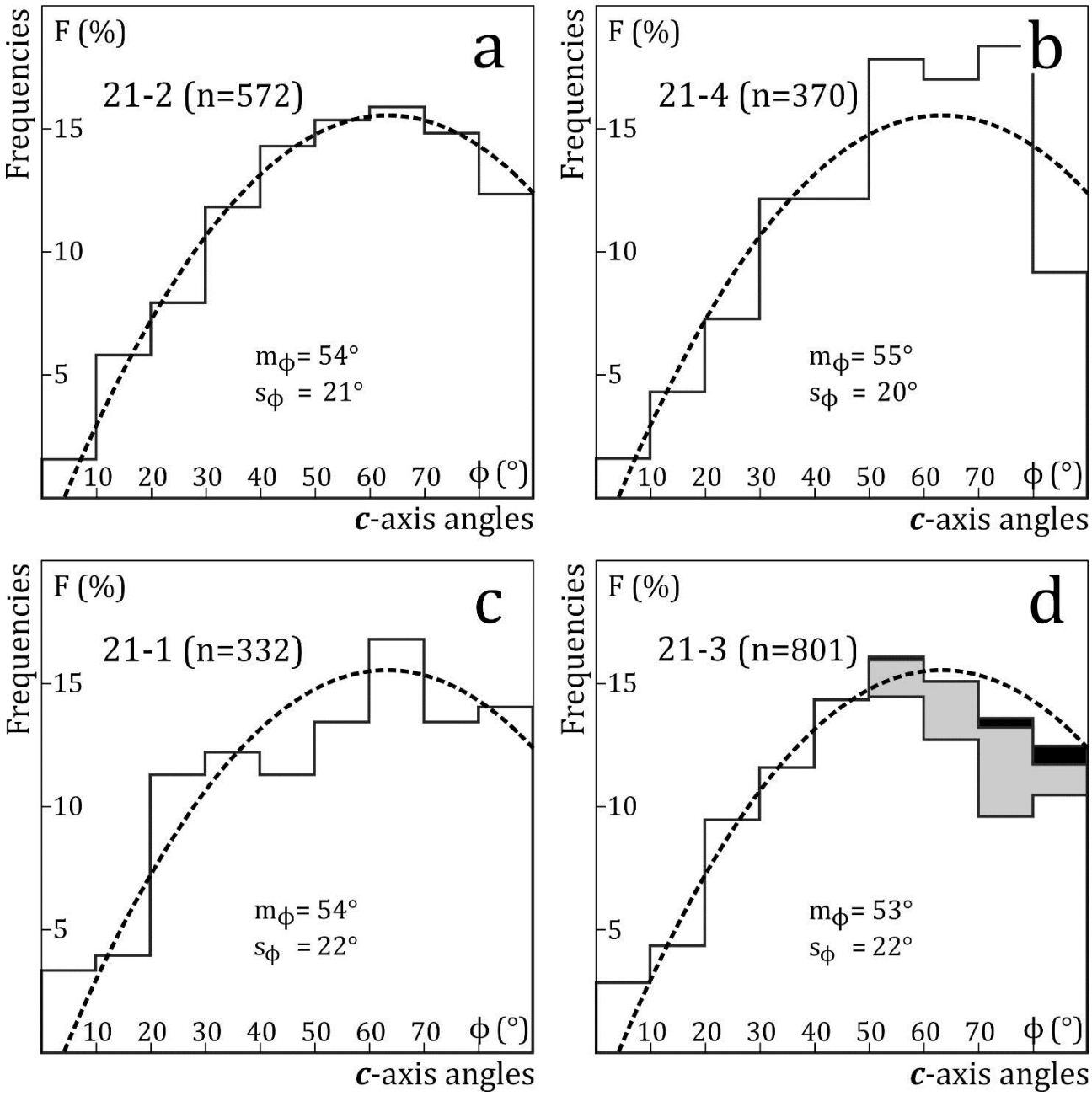

Figure S03. Distribution of the ***c***-axis angles for the four investigated samples: (**a**): unannealed; (**b**): annealed 10 h at 240 °C; (**c**): 288 °C; (**d**): 310 °C (Ketcham et al., 2015). white: continuous tracks; grey: stepped tracks; black: gapped tracks; the dashed line is a polynomial fit to the combined data for the four samples (including high-angle tracks); m_ϕ: mean angle; s_ϕ: standard deviation.

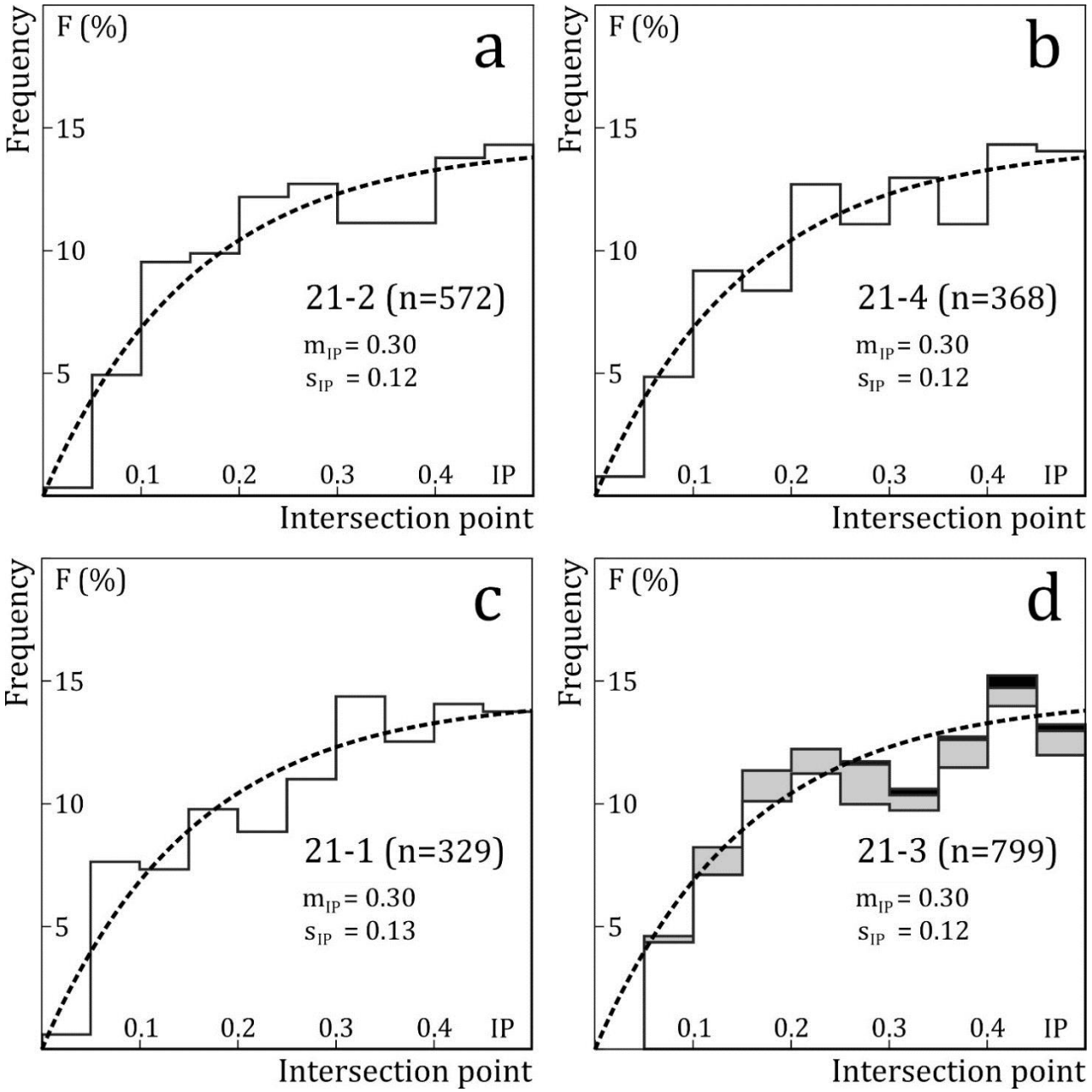

Figure S04. Distribution of the host-track intersections for the four investigated samples: (**a**): unannealed; (**b**): annealed 10 h at 240 °C; (**c**): 288 °C; (**d**): 310 °C (Ketcham et al., 2015). White: continuous tracks; grey: stepped tracks; black: gapped tracks; the dashed line is a polynomial fit to the combined data for the four samples (including high-angle tracks); m_{IP}: mean intersection; s_{IP}: standard deviation.

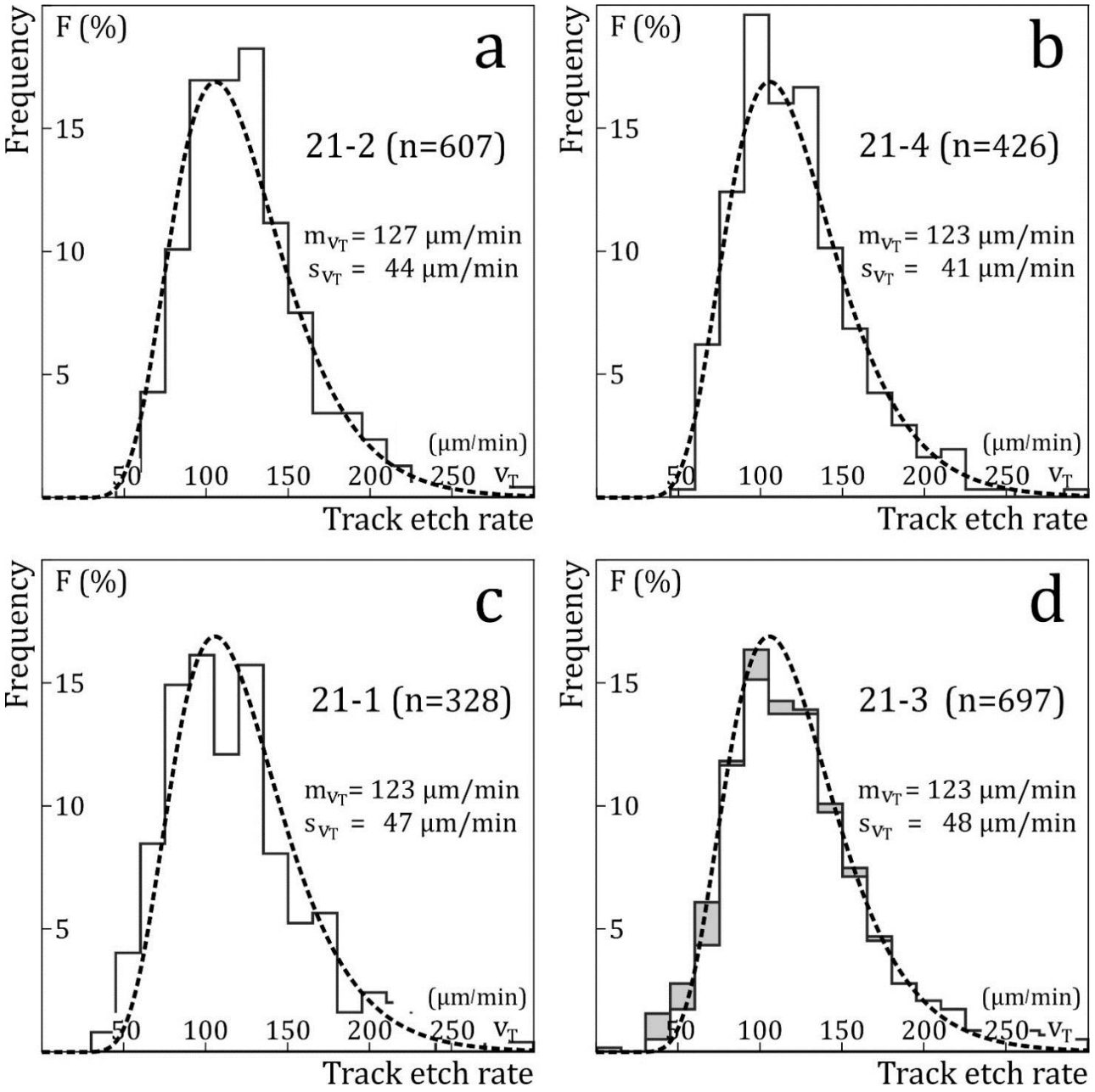

Figure S05. Distribution of the track etch rate for the four studied samples; (**a**): unannealed; (**b**): annealed 10 h at 240 °C; (**c**): 288 °C; (**d**): 310 °C (Ketcham et al., 2015). The dashed line is a polynomial fit to the combined data for the four samples; m_{VT} and s_{VT}: arithmetic mean and standard deviation.

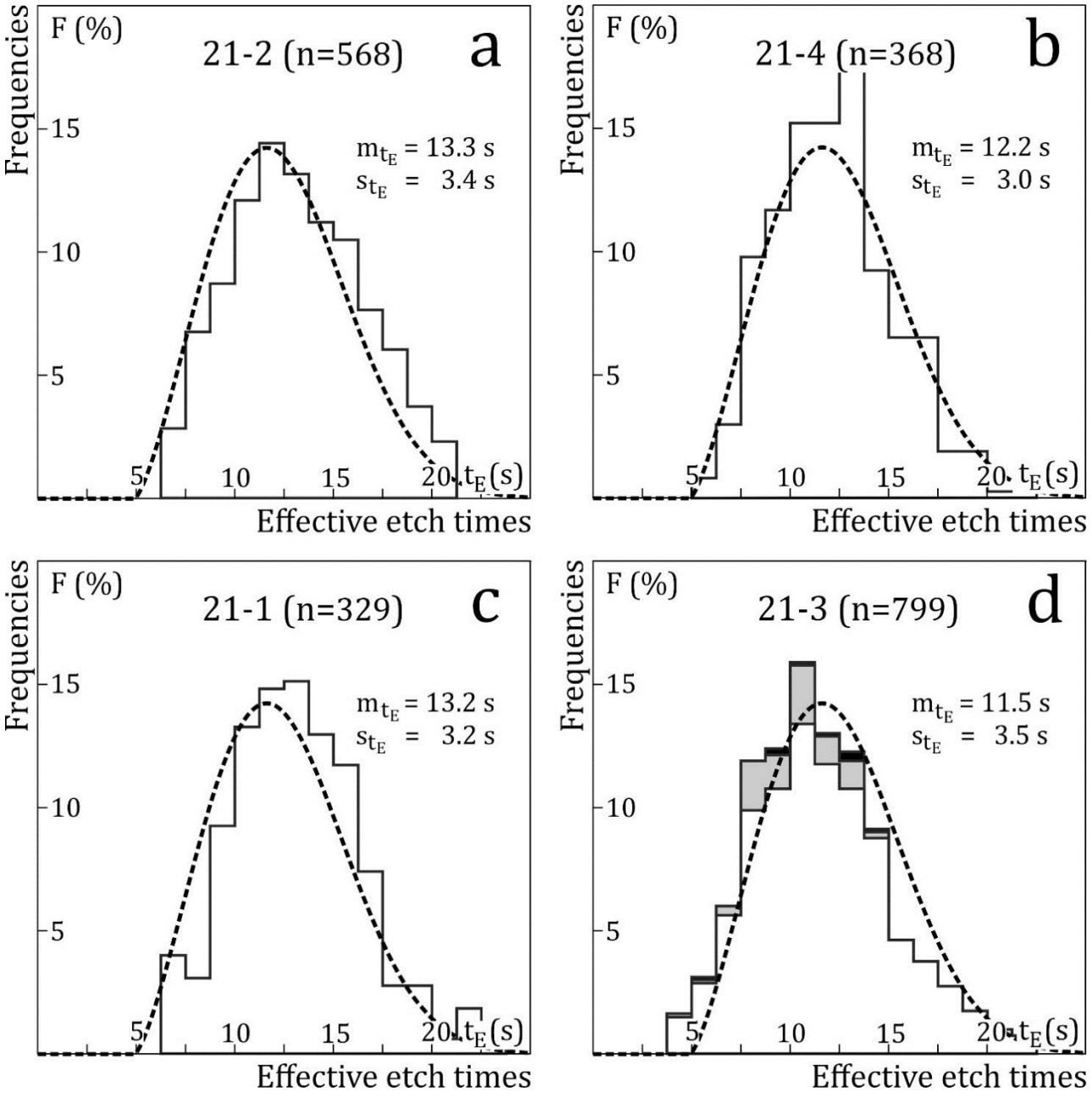

Figure S06. Effective etch time distributions for the four studied samples; (**a**): unannealed; (**b**): annealed 10 h at 240 °C; (**c**): 288 °C; (**d**): 310 °C (Ketcham et al., 2015). White: continuous tracks; grey: stepped tracks; black: gapped tracks; the short-dashed line is a polynomial fit to the combined data for the four samples; $t_{E,M}$ and s_{t_E}: arithmetic mean and standard deviation of the etch-time distribution.

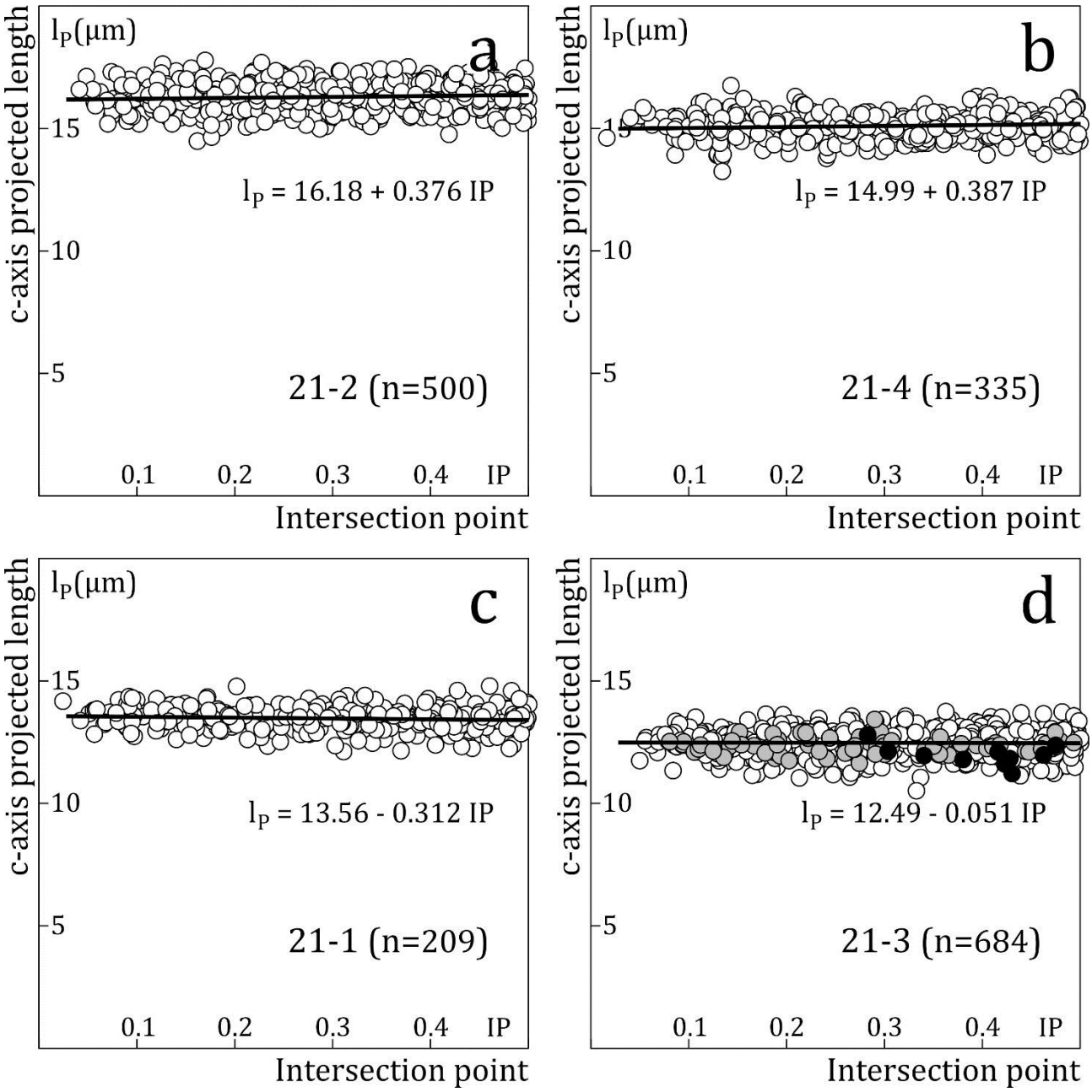

Figure S07. ***c***-axis-projected lengths of confined tracks plotted against their host-track intersections; (**a**): unannealed sample; (**b**): annealed 10 h at 240 °C; (**c**): 288 °C; (**d**): 310 °C (Ketcham et al., 2015). White: continuous tracks; grey: stepped tracks; black: gapped tracks; the solid lines are regression lines.

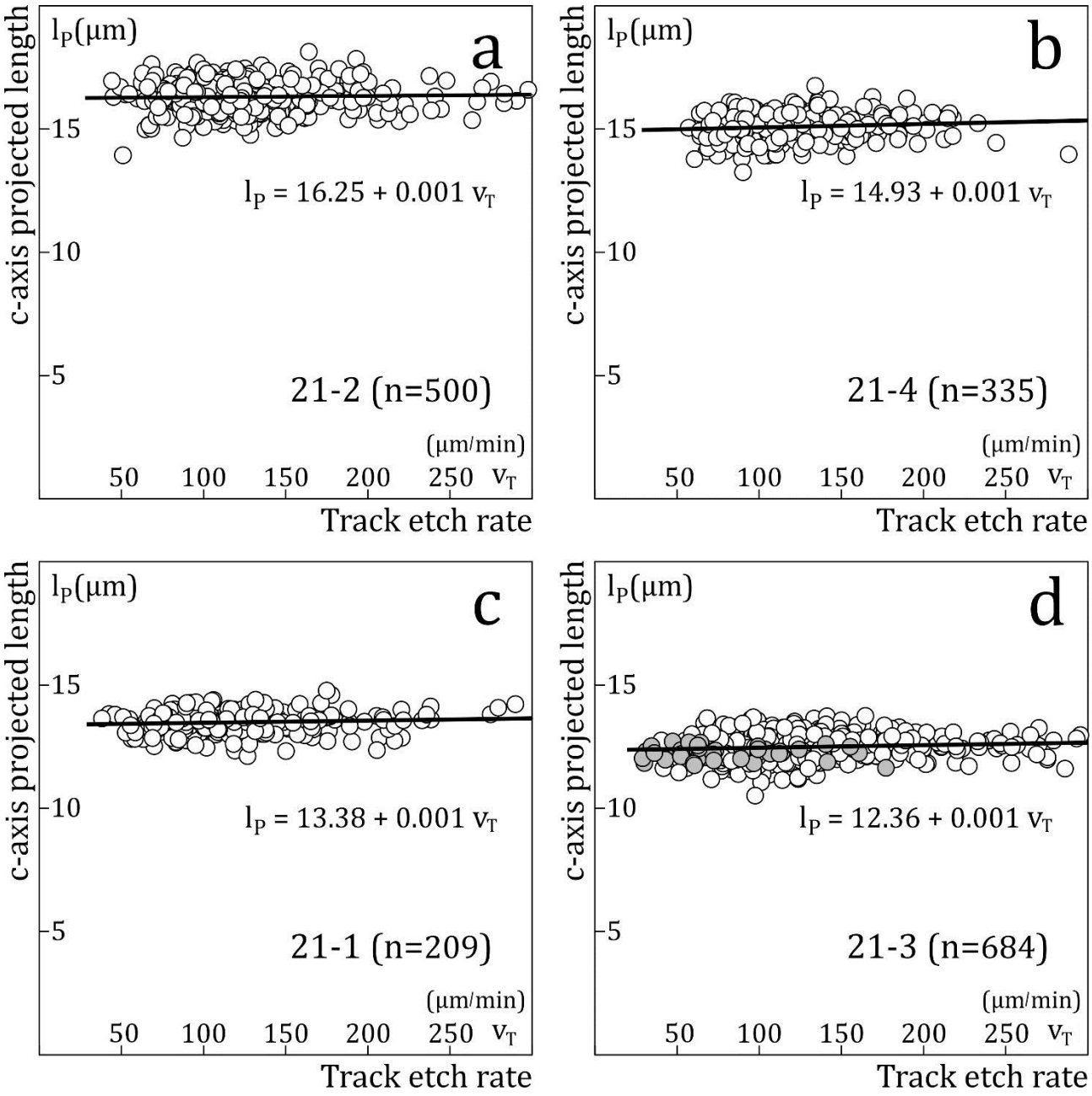

Figure S08. ***c***-axis-projected lengths of horizontal induced confined tracks plotted against their track etch rates; (**a**): unannealed sample; (**b**): annealed 10 h at 240 °C; (**c**): 288 °C; (**d**): 310 °C (Ketcham et al., 2015). White: continuous tracks; grey: stepped tracks; the solid lines are regression lines.

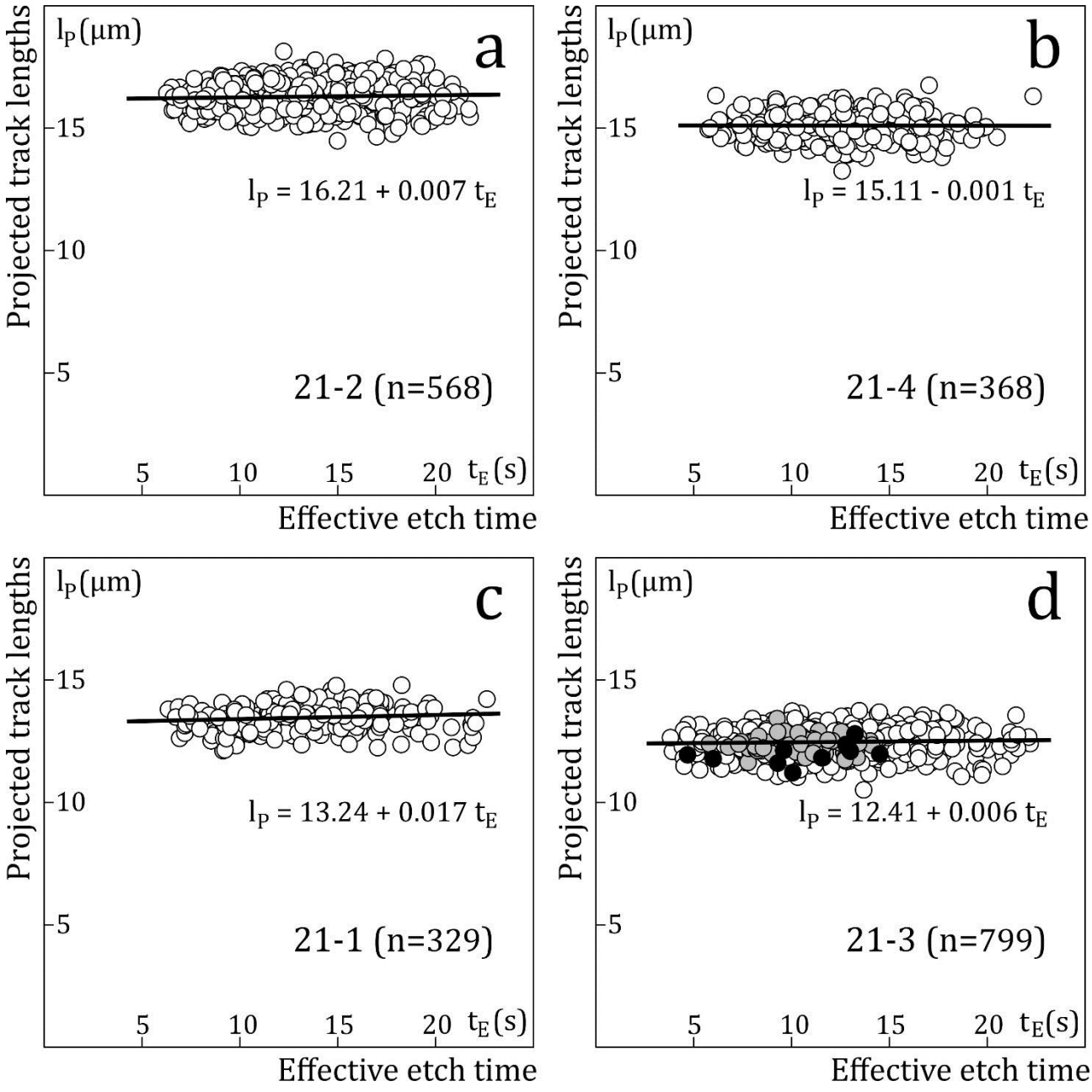

Figure S09. ***c***-axis-projected lengths of induced confined tracks plotted against their effective etch times; (**a**): unannealed sample; (**b**): annealed 10 h at 240 °C; (**c**): 288 °C; (**d**): 310 °C (Ketcham et al., 2015). White: continuous tracks; grey: stepped tracks; black: gapped tracks; the solid lines are regression lines.

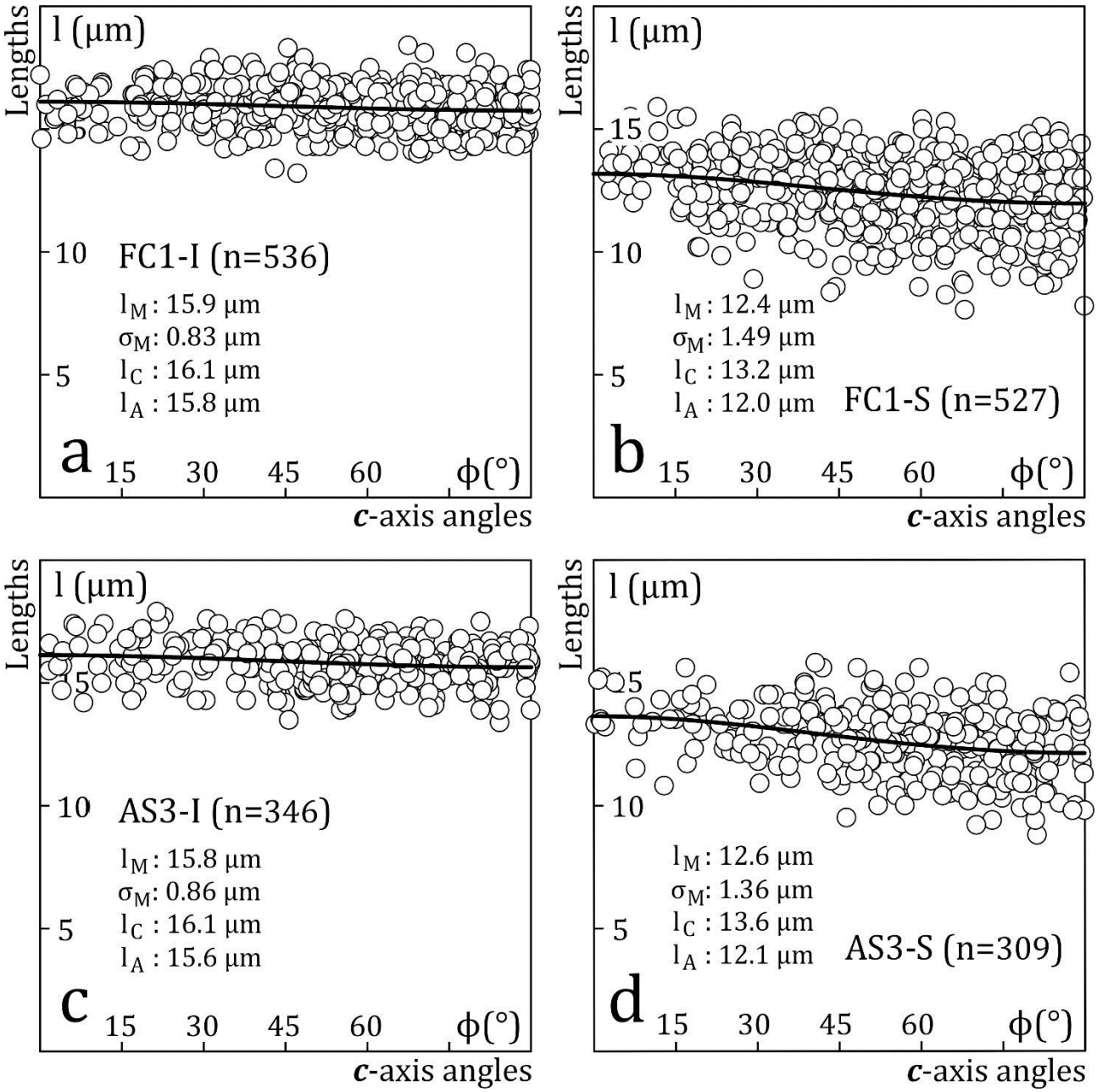

Figure S10. Measured lengths of induced and fossil confined tracks in samples from the Duluth complex; (**a**): FC-1 induced; (**b**): FC-1 fossil; (**c**): AS-3 induced; (**d**) AS3 fossil. The solid lines are ellipses fitted to the data; l_M: mean track length; s_M: standard deviation; l_C: ***c***-axis intercept of ellipse; l_A: ***a***-axis intercept.

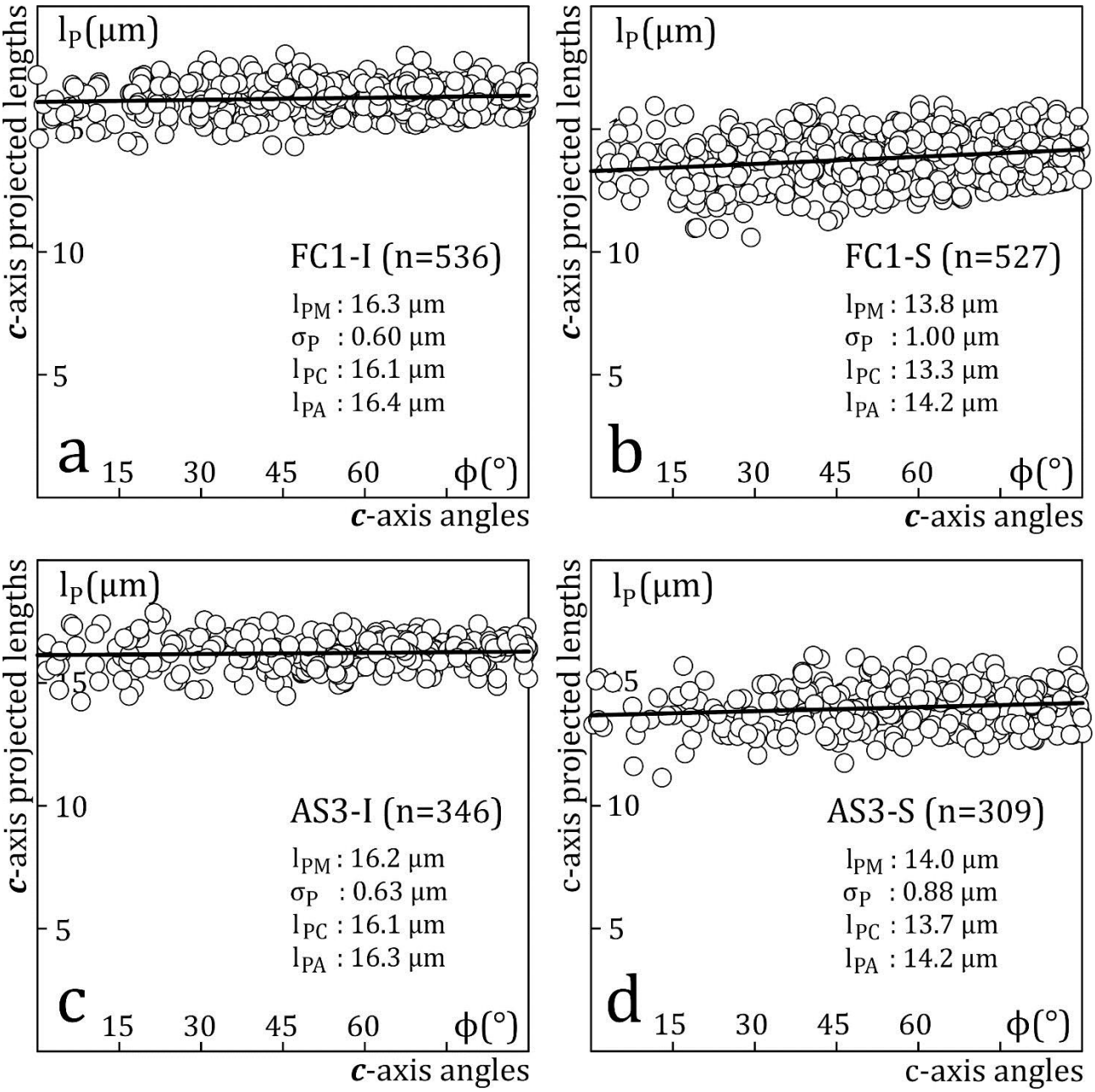

Figure S11. ***c***-axis-projected lengths of induced and fossil confined tracks in samples from the Duluth complex; (**a**): FC-1 induced; (**b**): FC-1 fossil; (**c**): AS-3 induced; (**d**) AS3 fossil. The solid lines are regression lines; l_{PM}: mean track length; s_{PM}: standard deviation; l_{PC}: ***c***-axis intercept of ellipse; l_{PA}: ***a***-axis intercept.

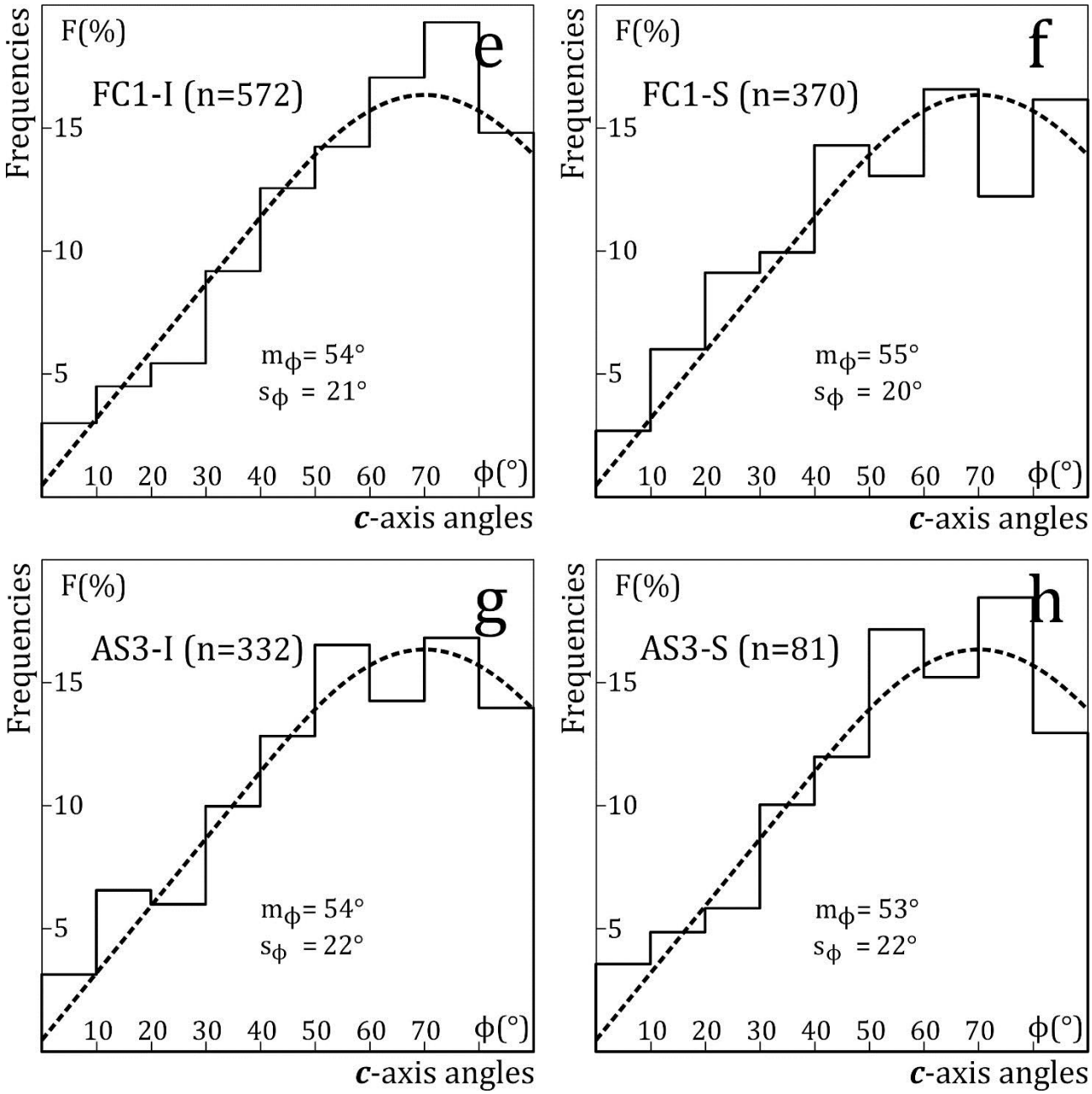

Figure S12. Distribution of the ***c***-axis angles of induced and fossil confined tracks in samples from the Duluth complex; (**a**): FC-1 induced; (**b**): FC-1 fossil; (**c**): AS-3 induced; (**d**) AS-3 fossil. The dashed line is a polynomial fit to the combined data for the four samples; m_ϕ: mean; s_ϕ: standard deviation.

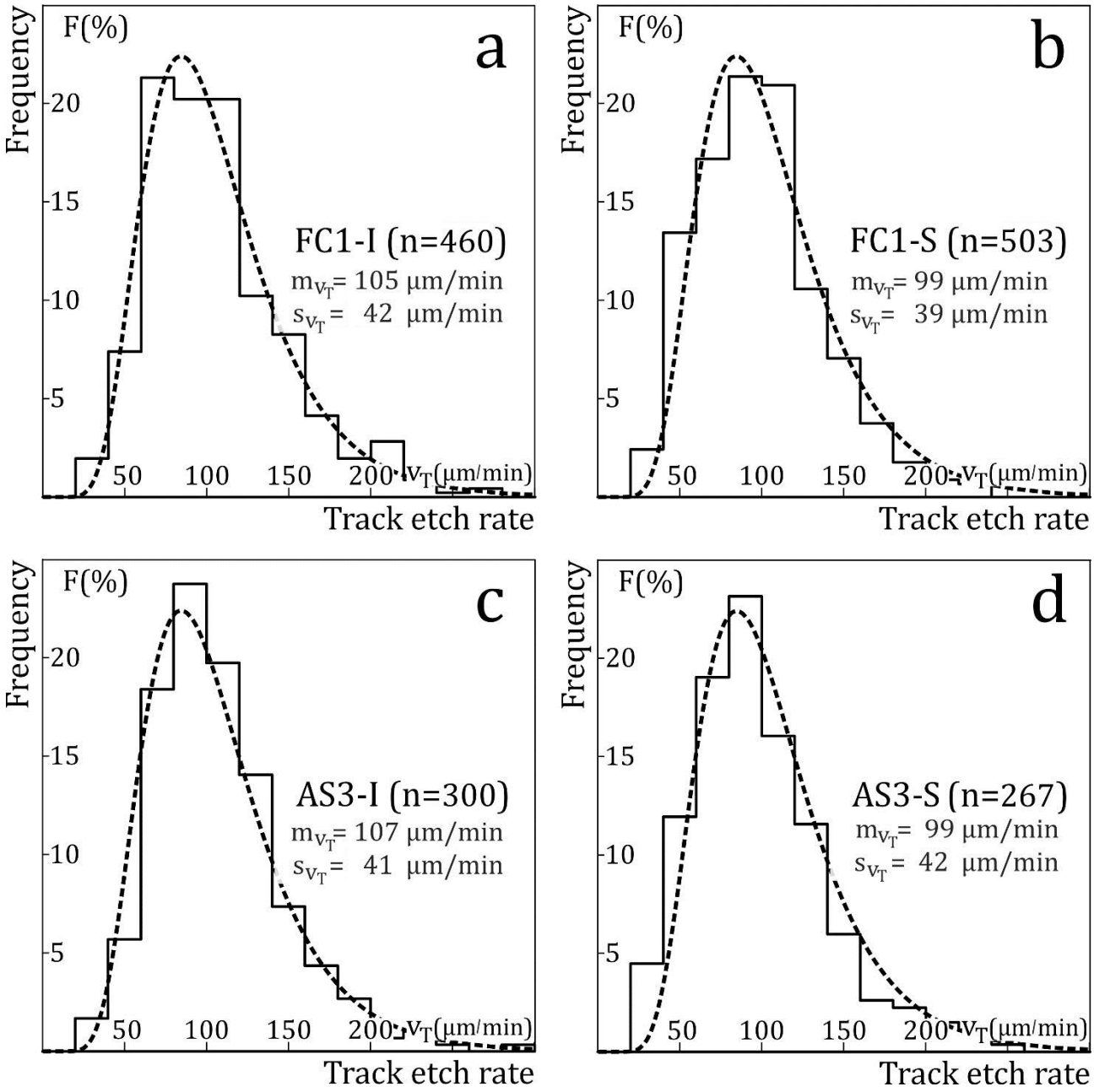

Figure S13. Distribution of the etch rates of induced and fossil confined tracks in apatite samples from the Duluth complex; (**a**): FC-1 induced; (**b**): FC-1 fossil; (**c**): AS-3 induced; (**d**) AS-3 fossil. The dashed line is a polynomial fit to the combined data for the four samples; m_{VT}: mean track etch rate; s_{VT}: standard deviation.

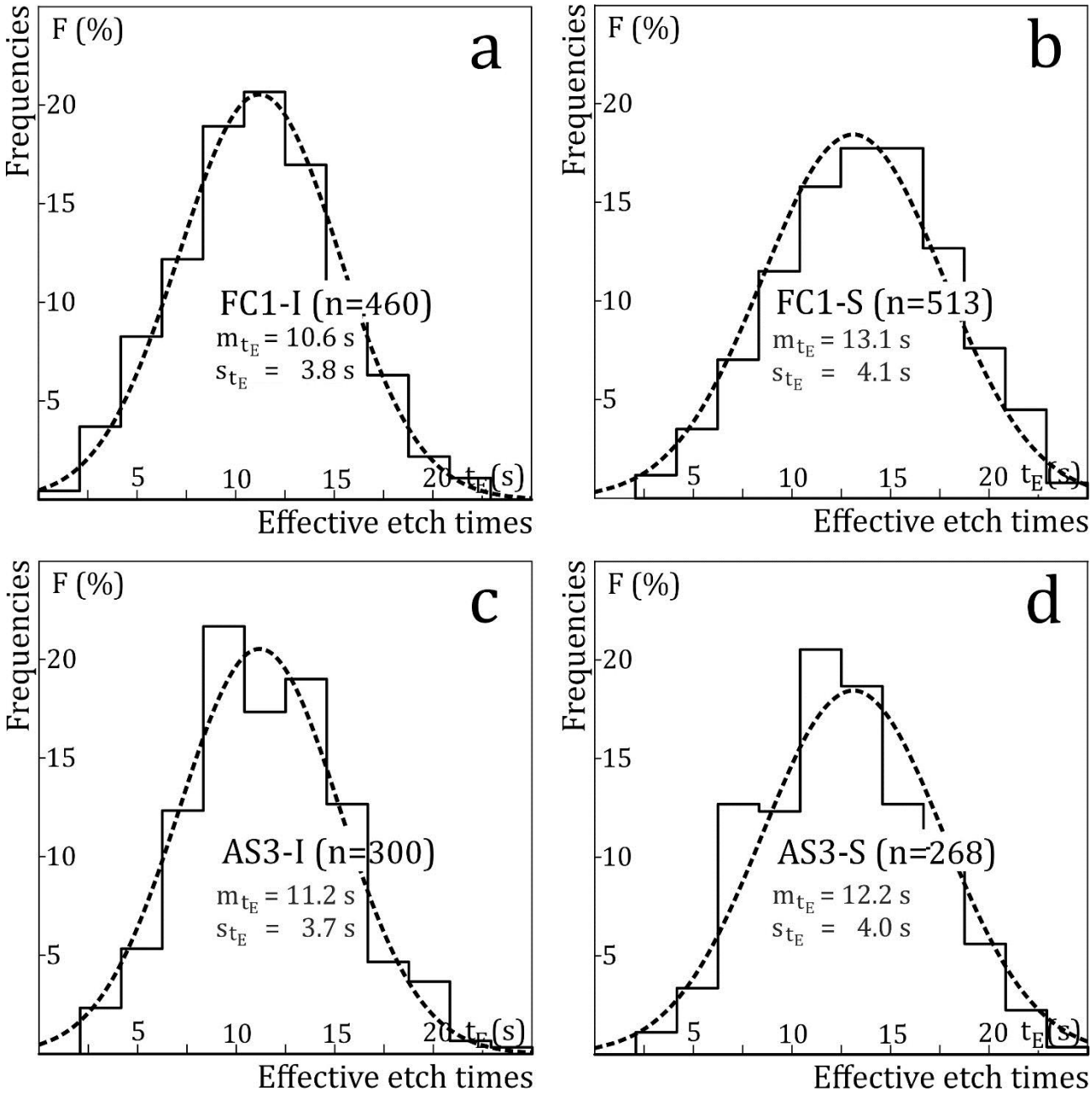

Figure S14. Effective-etch time-distributions of induced and fossil confined tracks in apatite samples from the Duluth complex; (**a**): FC-1 induced; (**b**): FC-1 fossil; (**c**): AS-3 induced; (**d**) AS-3 fossil. The dashed line is a polynomial fit to the combined data for the four samples; m_{TE} and s_{TE}: mean and standard deviation.

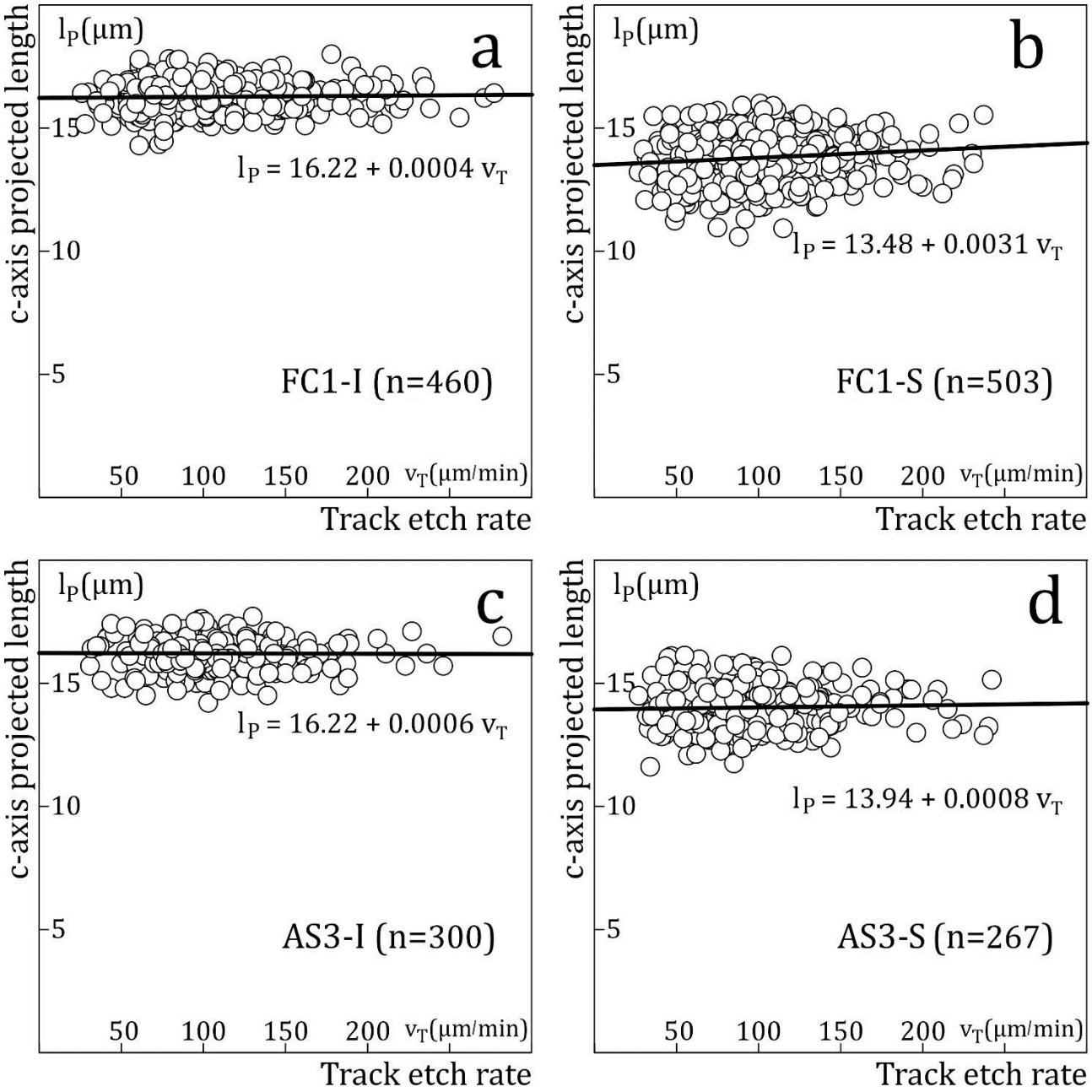

Figure S15. ***c***-axis-projected lengths of induced and fossil confined tracks in apatite samples from the Duluth complex plotted against their track etch rates; (**a**): FC-1 induced; (**b**): FC-1 fossil; (**c**): AS-3 induced; (**d**) AS-3 fossil. The solid lines are regression lines.

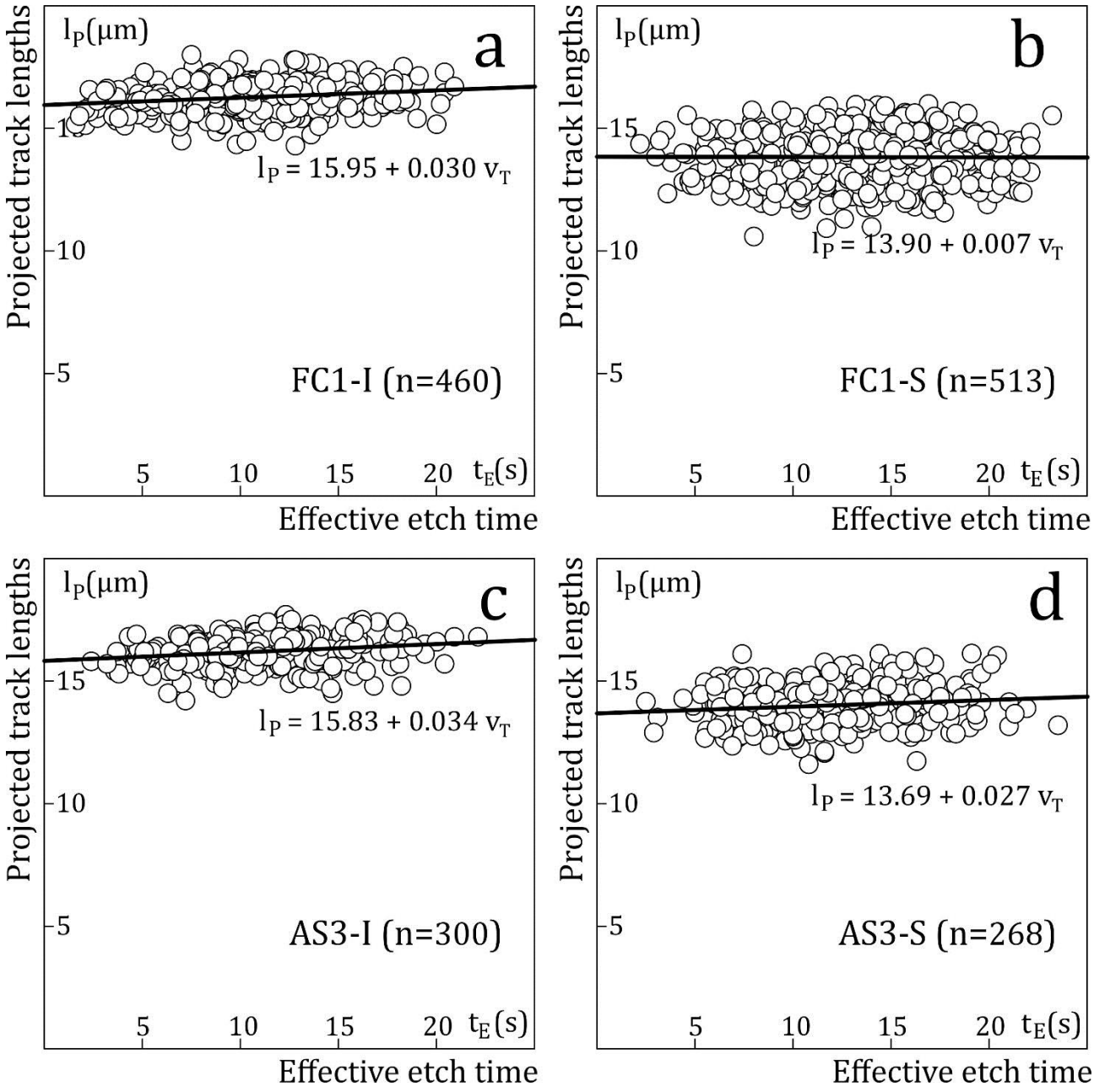

Figure S16. ***c***-axis-projected lengths of induced and fossil confined tracks in apatite samples from the Duluth complex plotted against their effective etch times; (**a**): FC-1 induced; (**b**): FC-1 fossil; (**c**): AS-3 induced; (**d**) AS-3 fossil. The solid lines are regression lines.