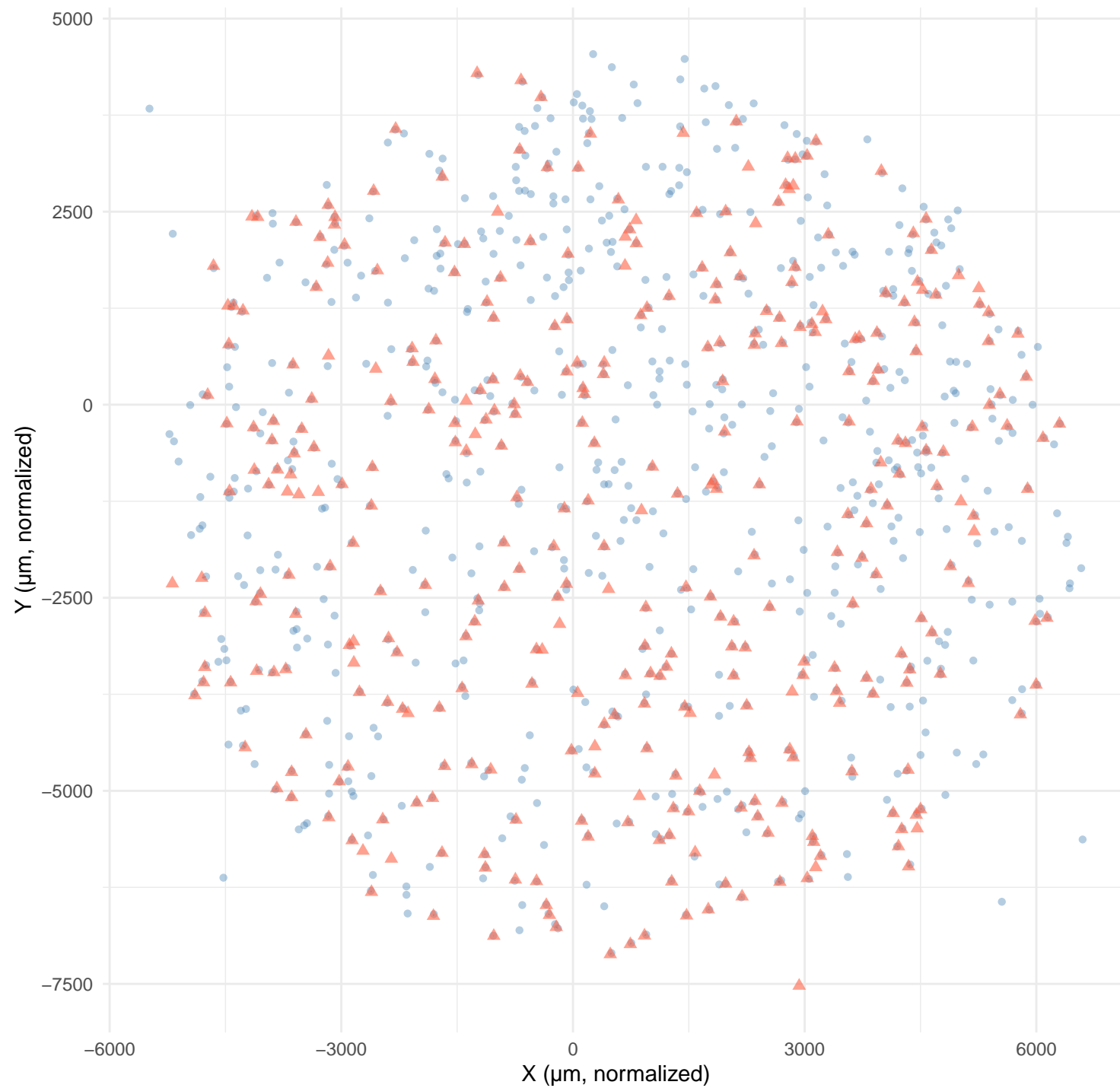


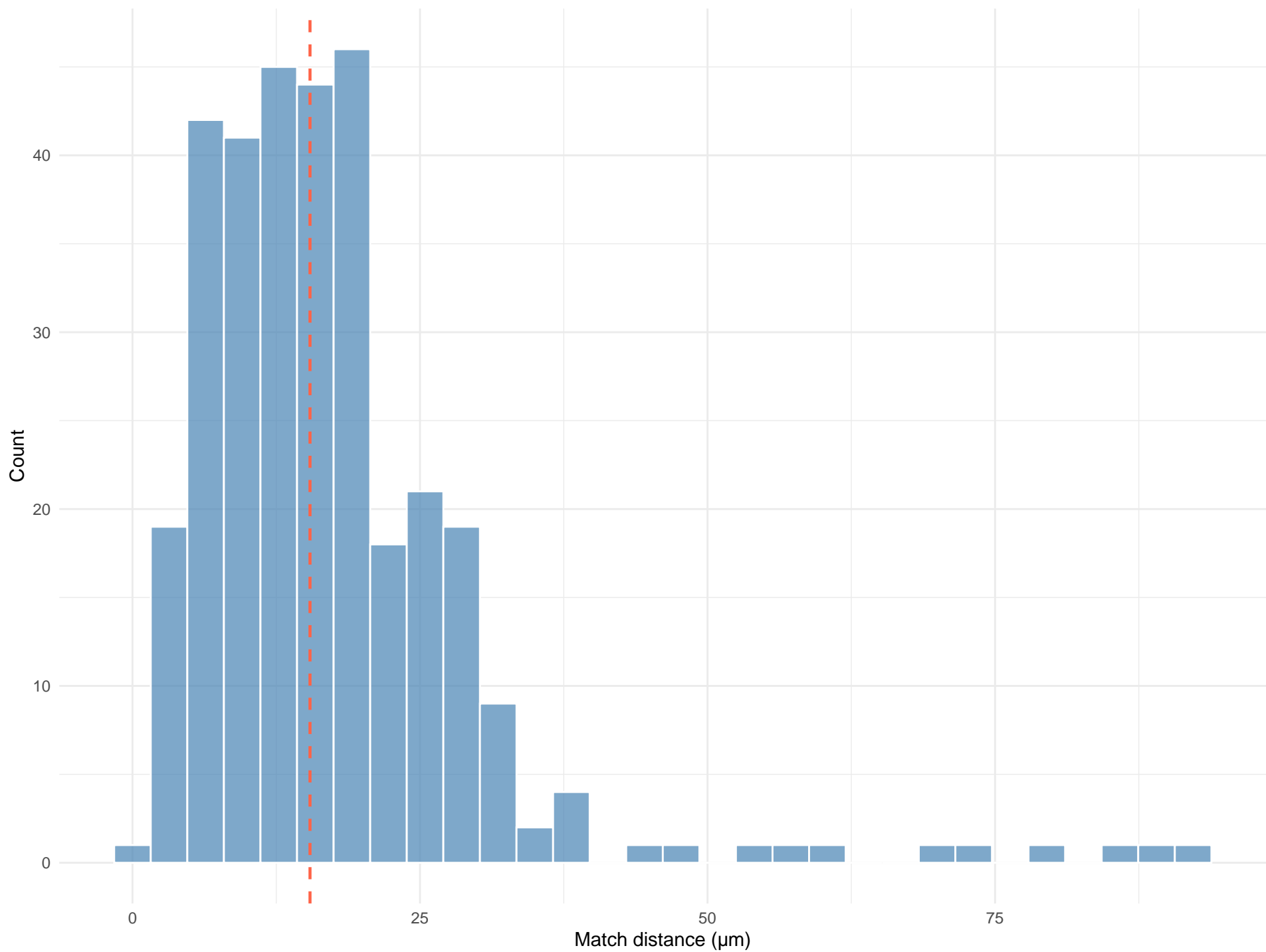
FTIR...Raman Particle Overlay (aligned coordinates)

Red triangles = FTIR, Blue circles = Raman, Lines = matched pairs

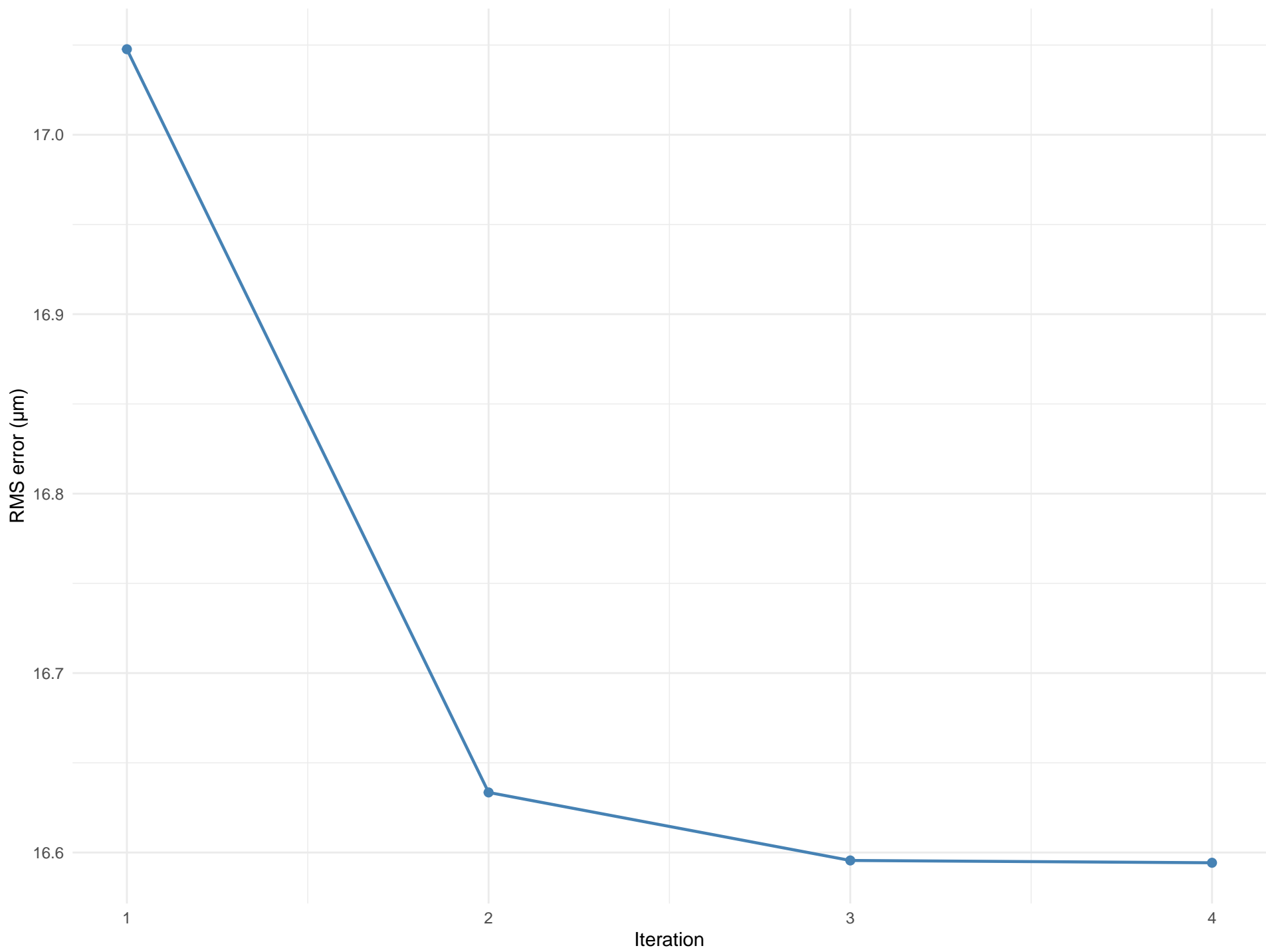


Match Distance Distribution

Median = 15.44 μm , n = 322 pairs

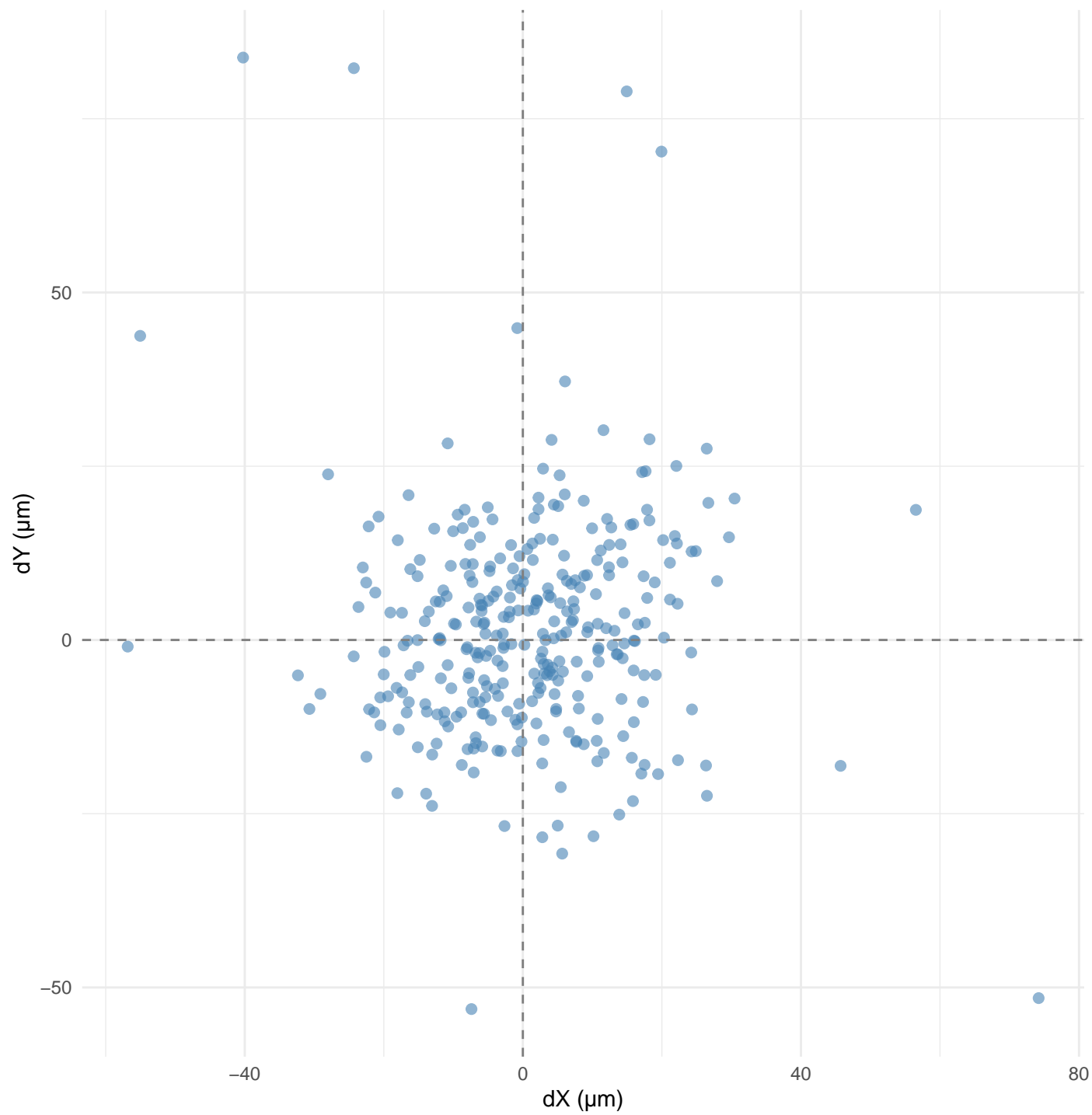


ICP Convergence
Converged: TRUE, Iterations: 4



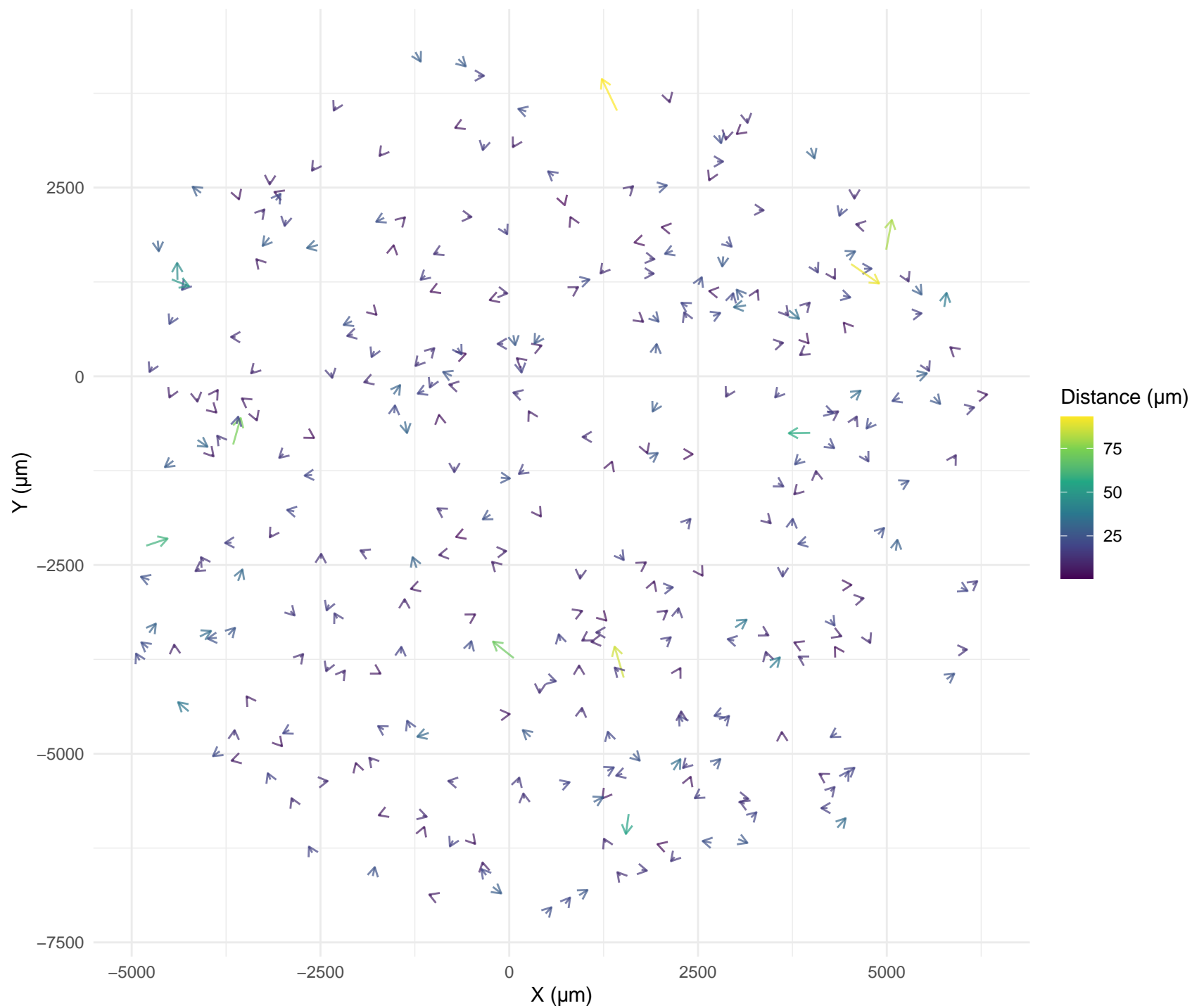
Alignment Residuals

Offset from FTIR (transformed) to Raman (nearest match)



Residual Vector Field

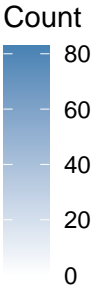
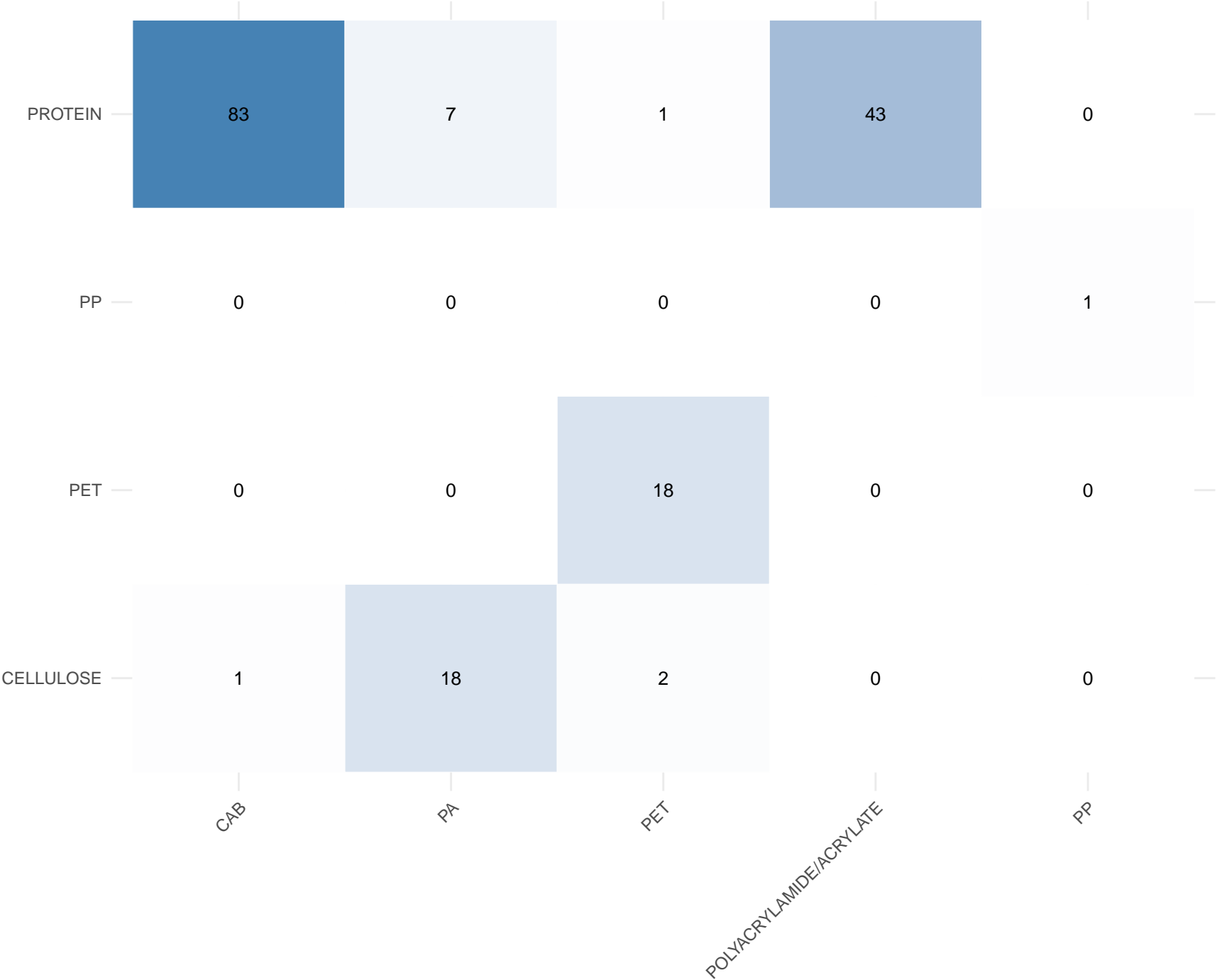
Arrows magnified 5x | Systematic patterns indicate local distortion



Material Confusion Matrix (FTIR vs Raman)

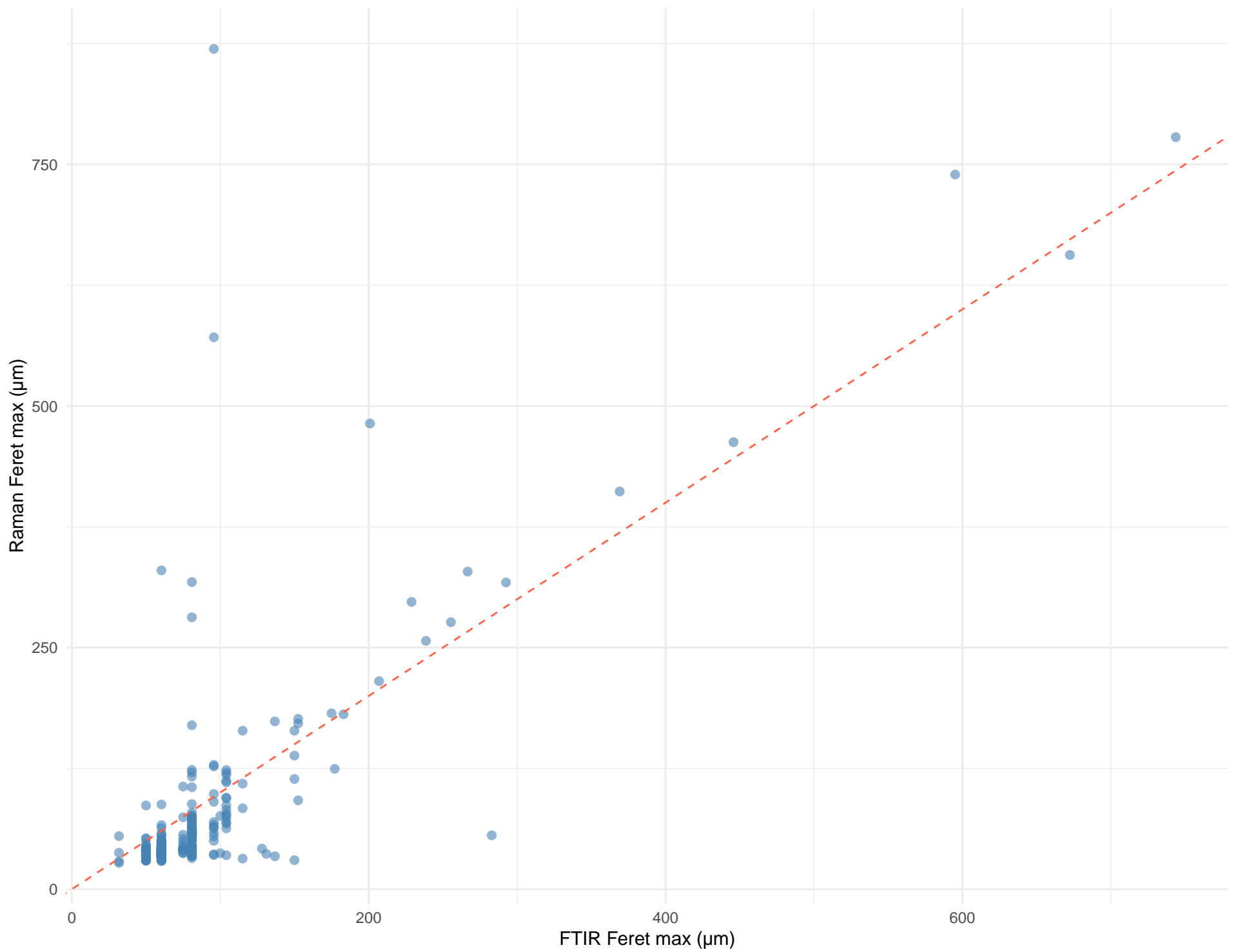
Exact: 0% | Family: 11.5% | Family+: 11.5%

FTIR material



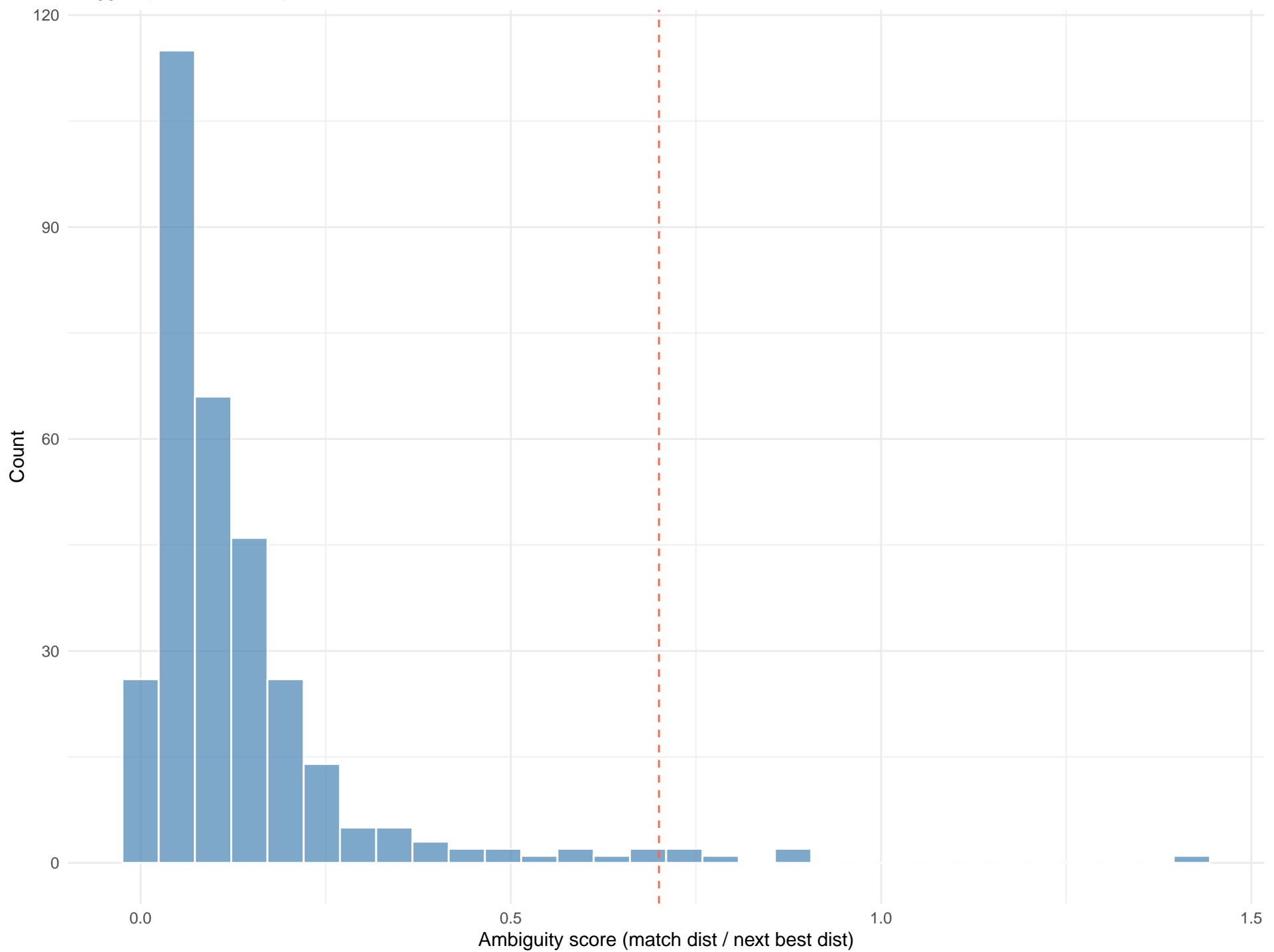
Raman material

Particle Size Comparison (matched pairs)



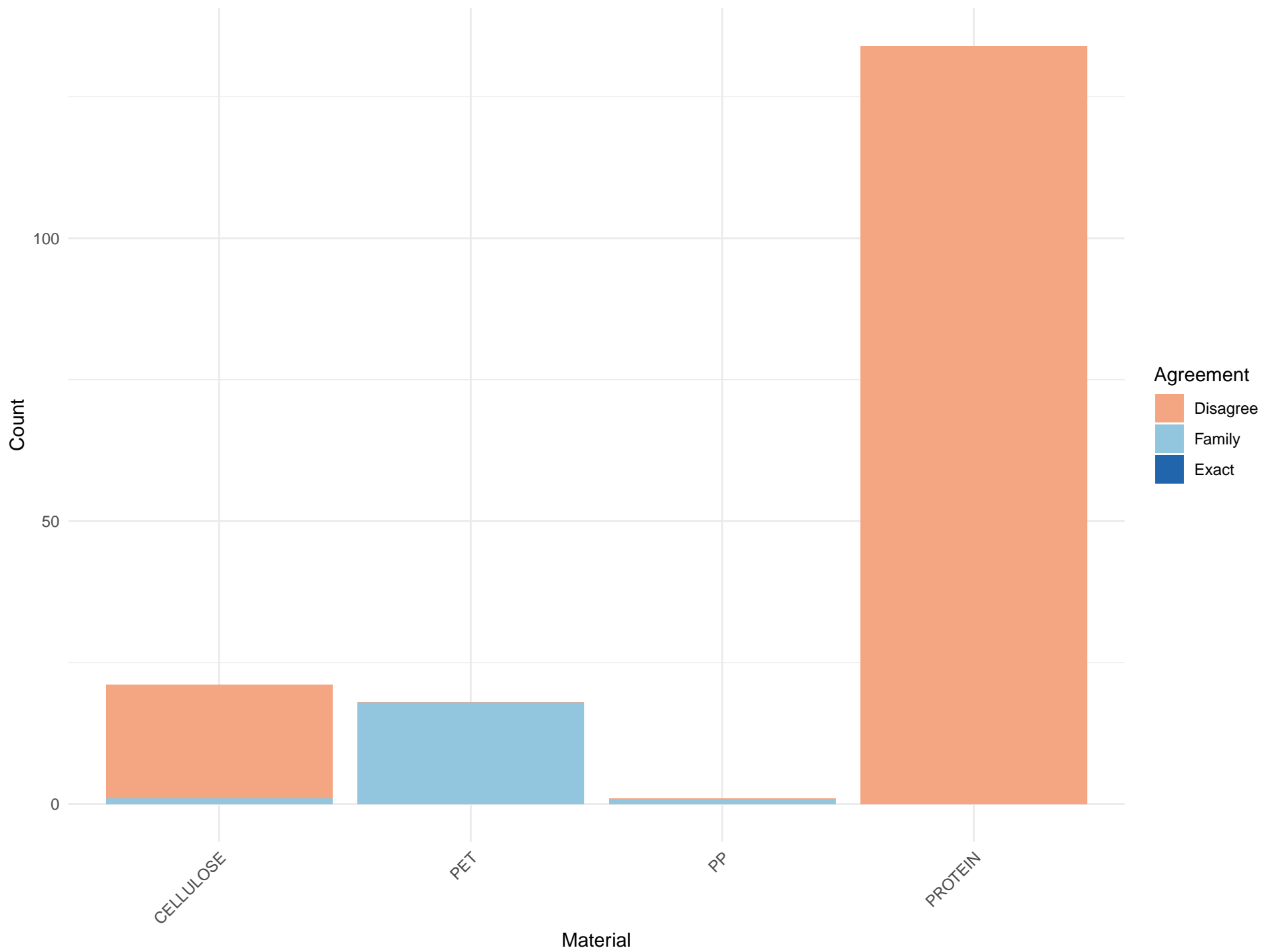
Match Ambiguity Score Distribution

Flagged (>0.7): 7 of 322 pairs



Tiered Agreement by Material

Overall: Exact 0%, Family+ 11.5%



LDIR...Raman Particle Overlay (aligned coordinates)

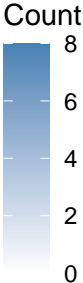
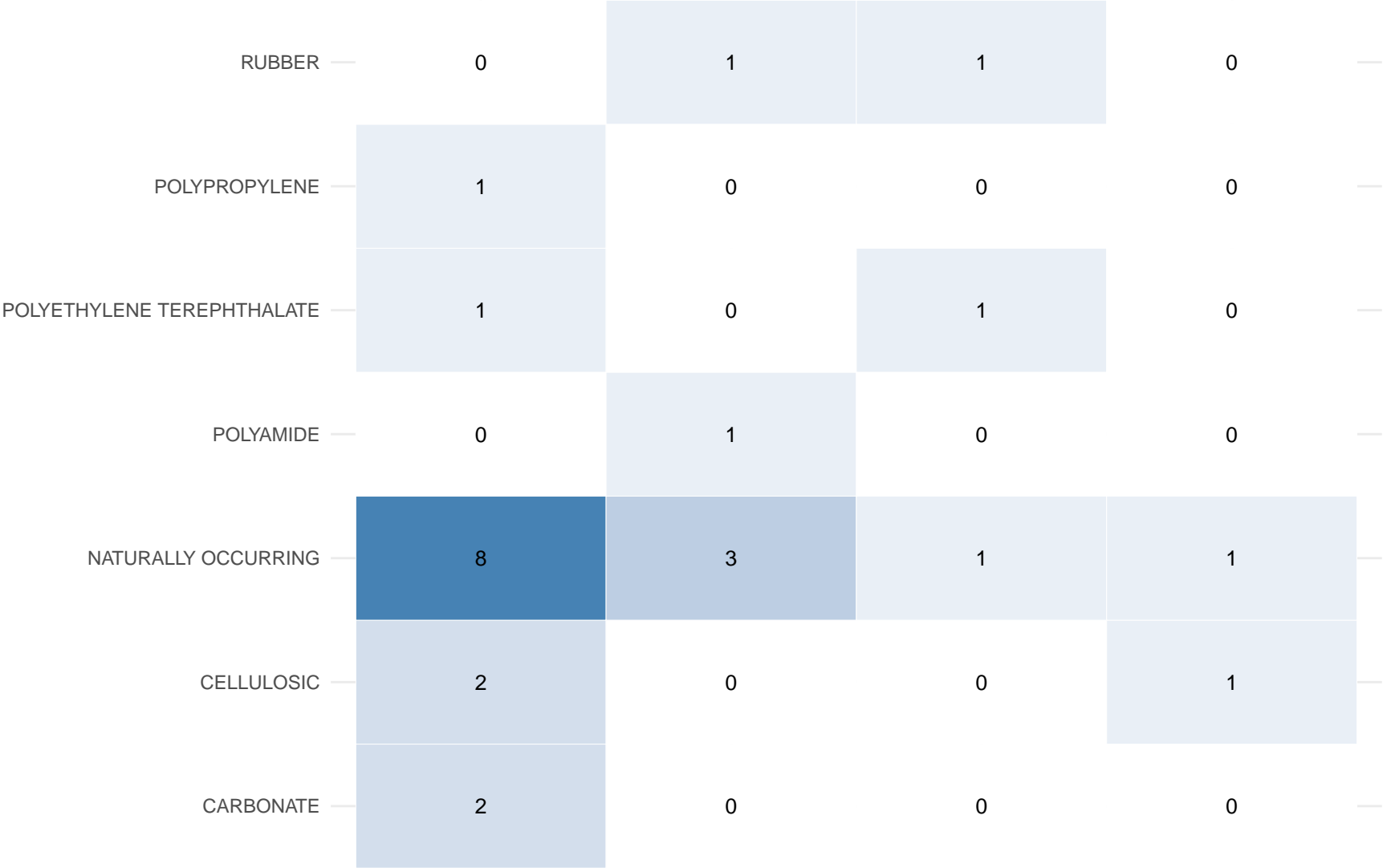
Green triangles = LDIR, Blue circles = Raman



Material Confusion Matrix (LDIR vs Raman)

Exact: 0% | Family: 16.7% | Family+: 16.7%

LDIR material



Raman material

POLYACRYLAMIDE/ACRYLATE