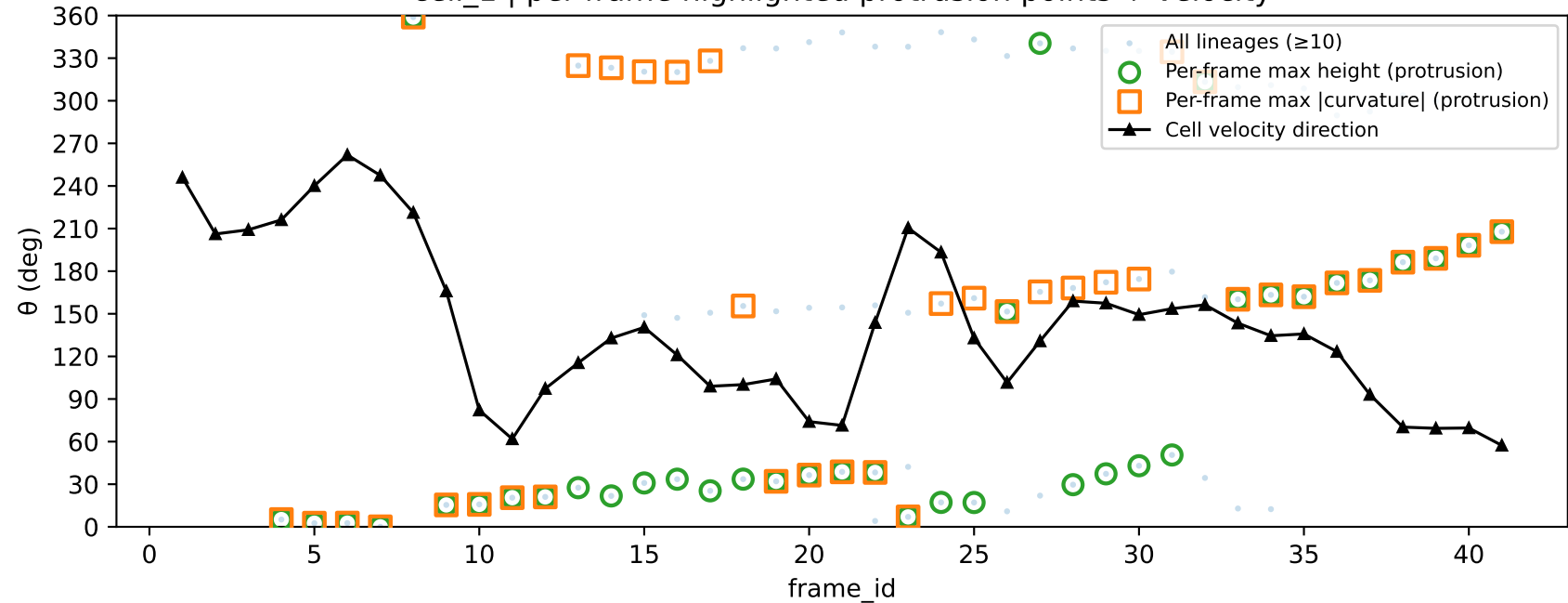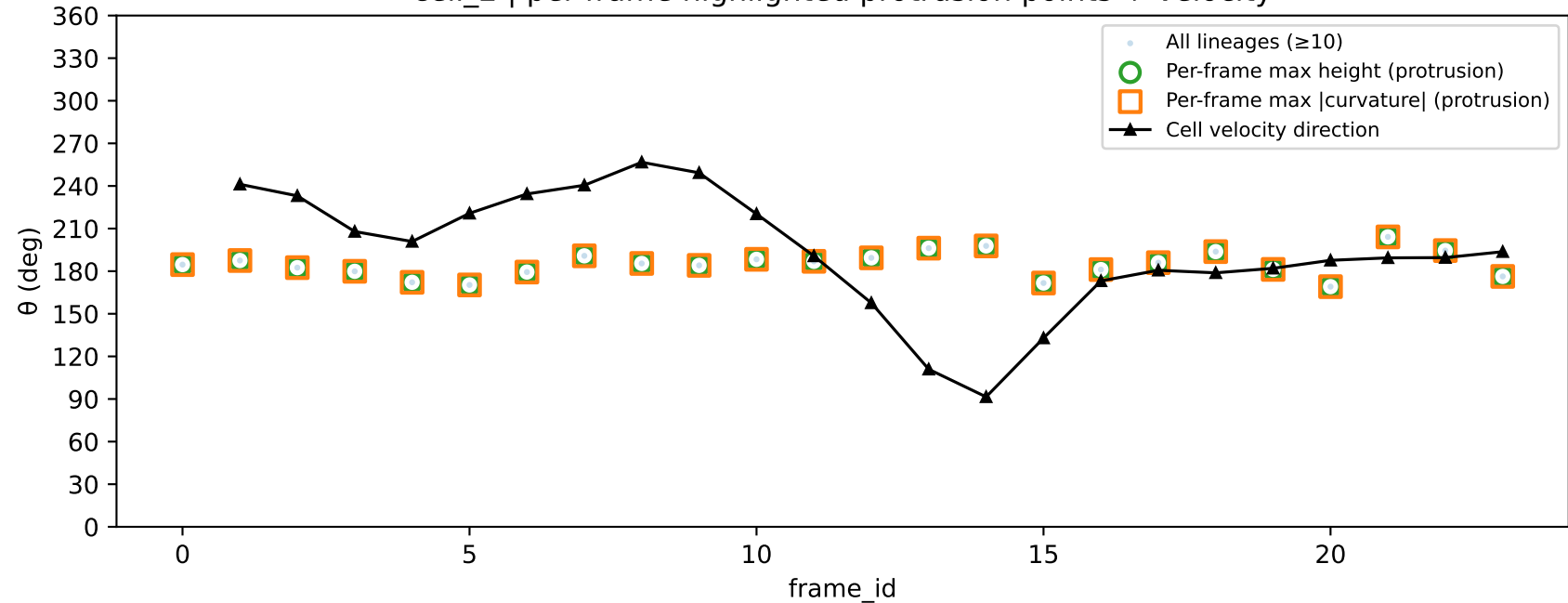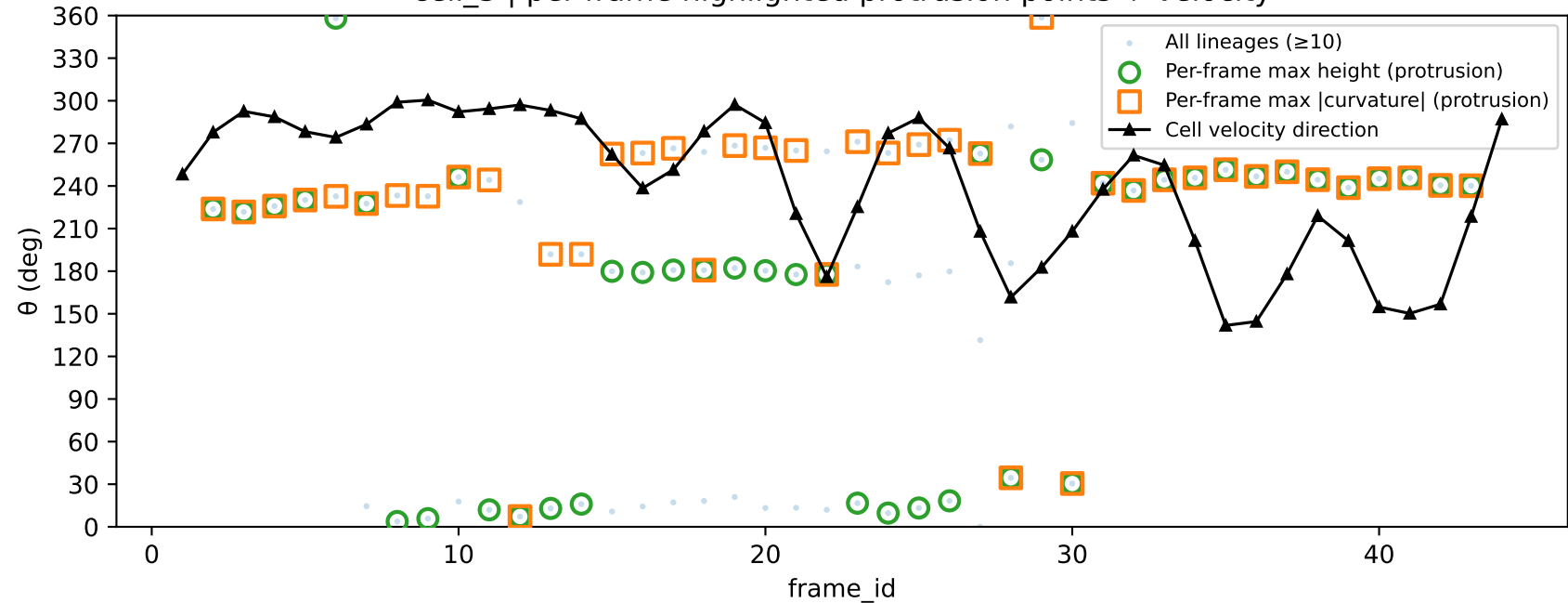cell_1 | per-frame highlighted protrusion points + velocity
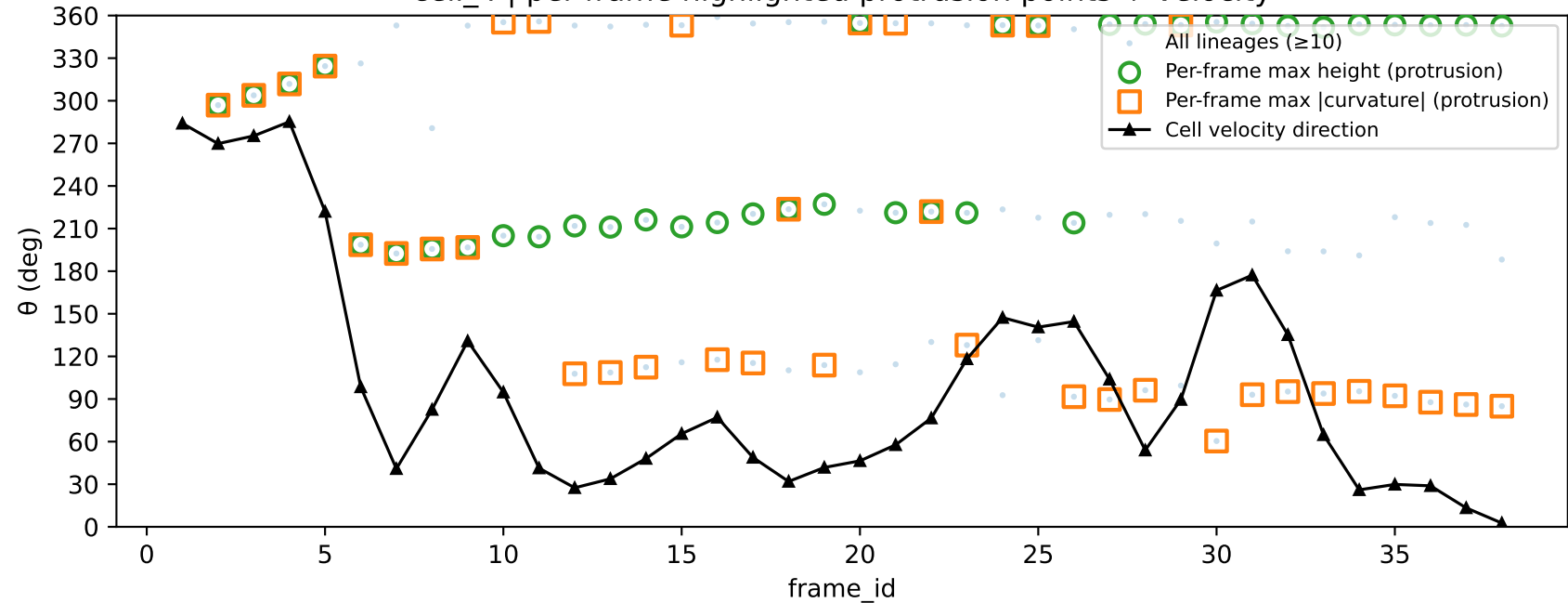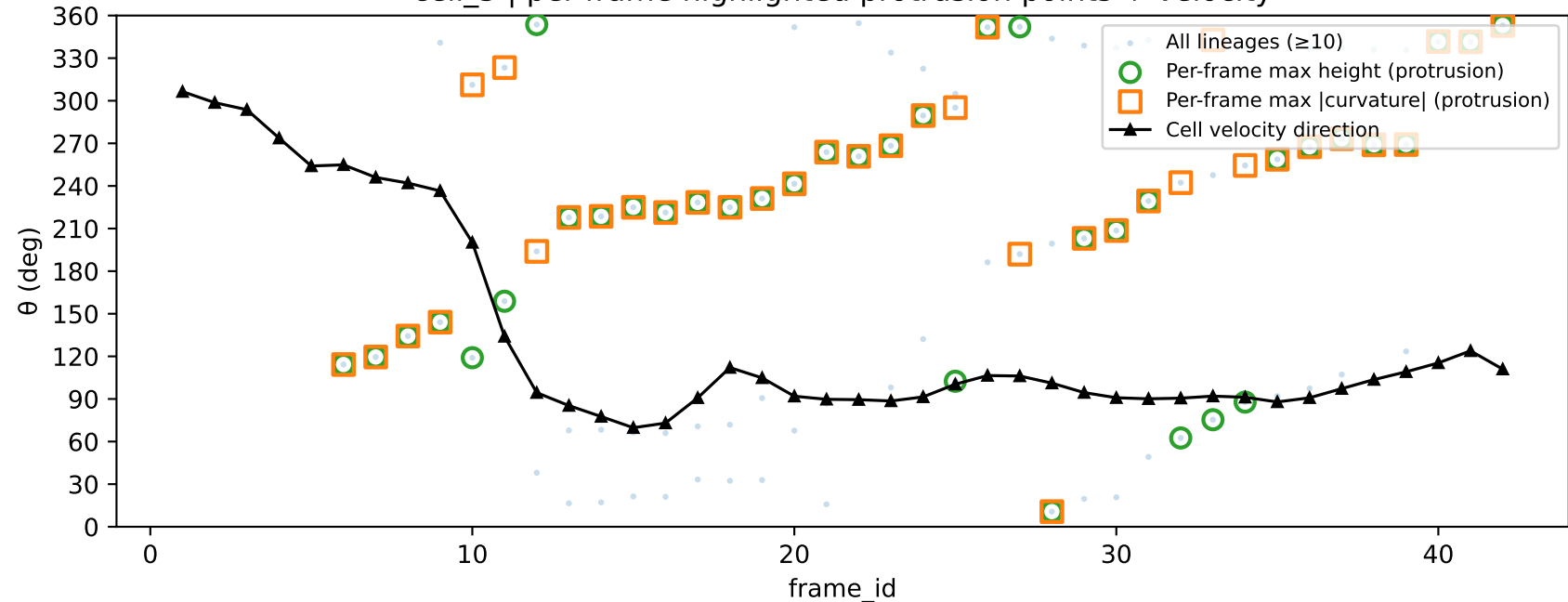
cell_2 | per-frame highlighted protrusion points + velocity

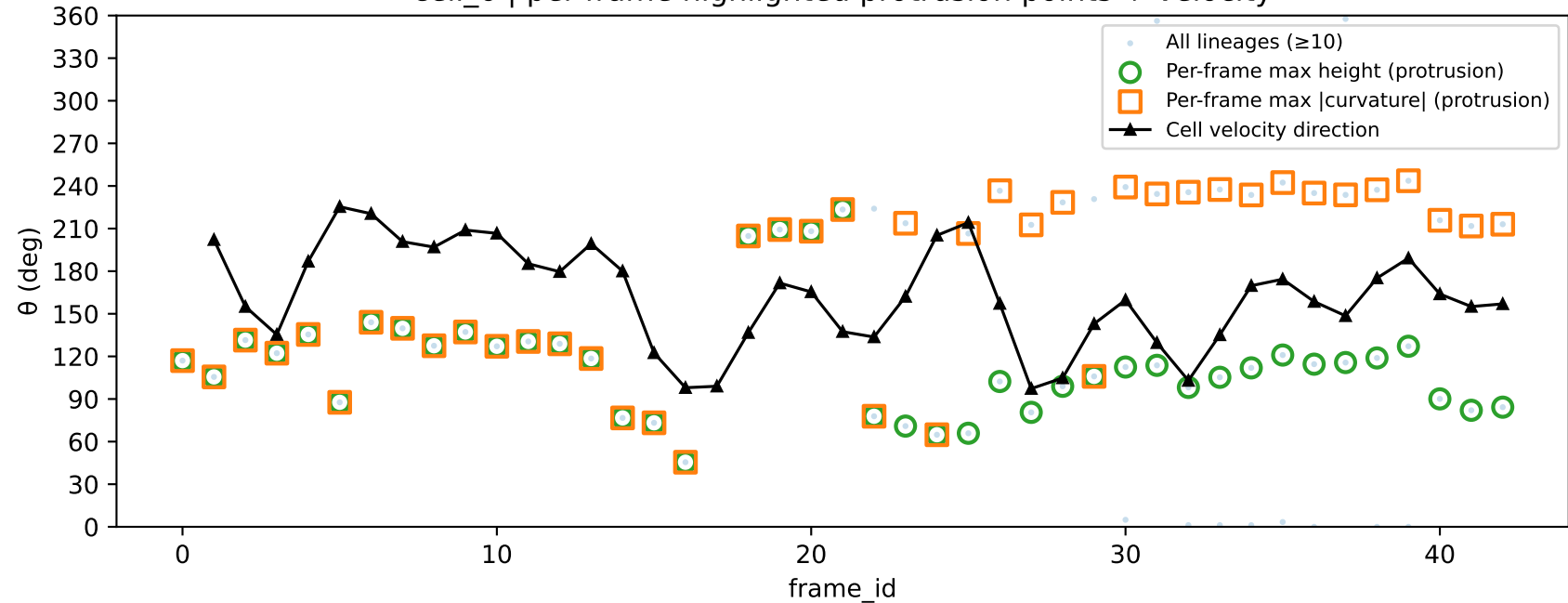cell_3 | per-frame highlighted protrusion points + velocity

cell_4 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

cell_5 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

x-axis: frame_id
y-axis: θ (deg)

cell_6 | per-frame highlighted protrusion points + velocity

cell_7 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

Axes: θ (deg) vs frame_id

cell_8 | per-frame highlighted protrusion points + velocity

cell_9 | per-frame highlighted protrusion points + velocity

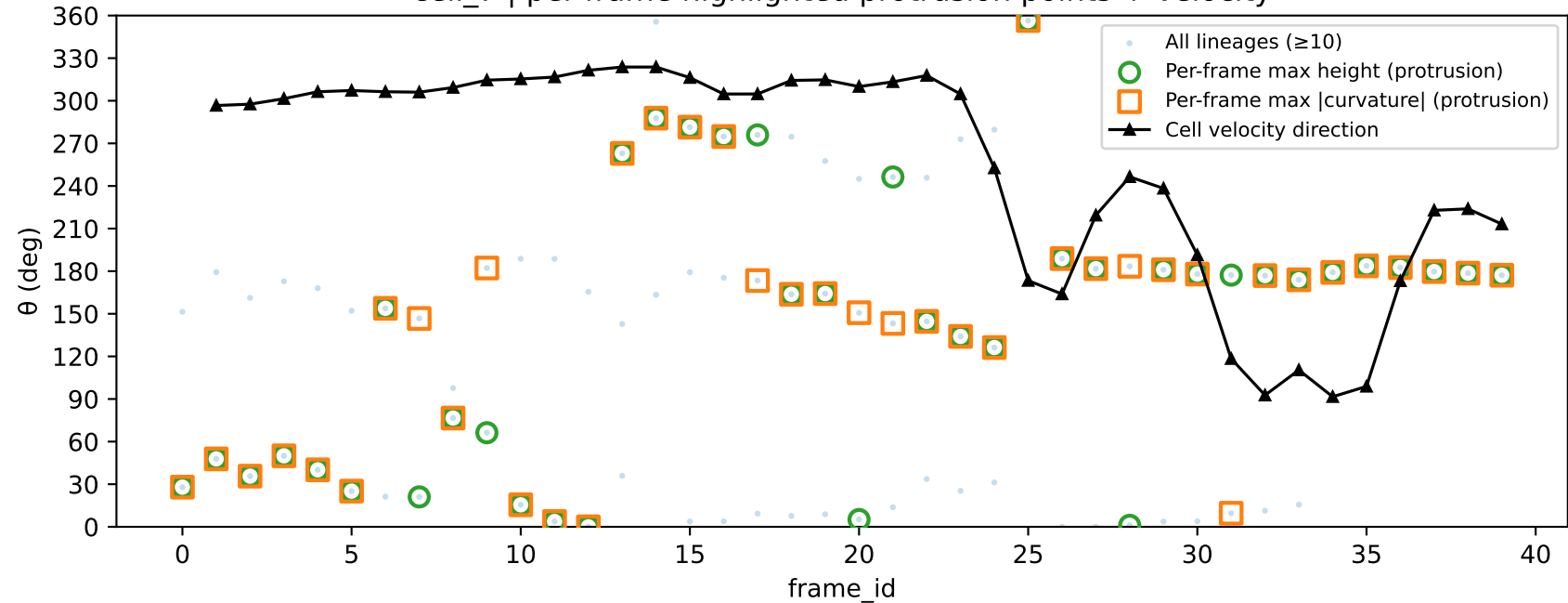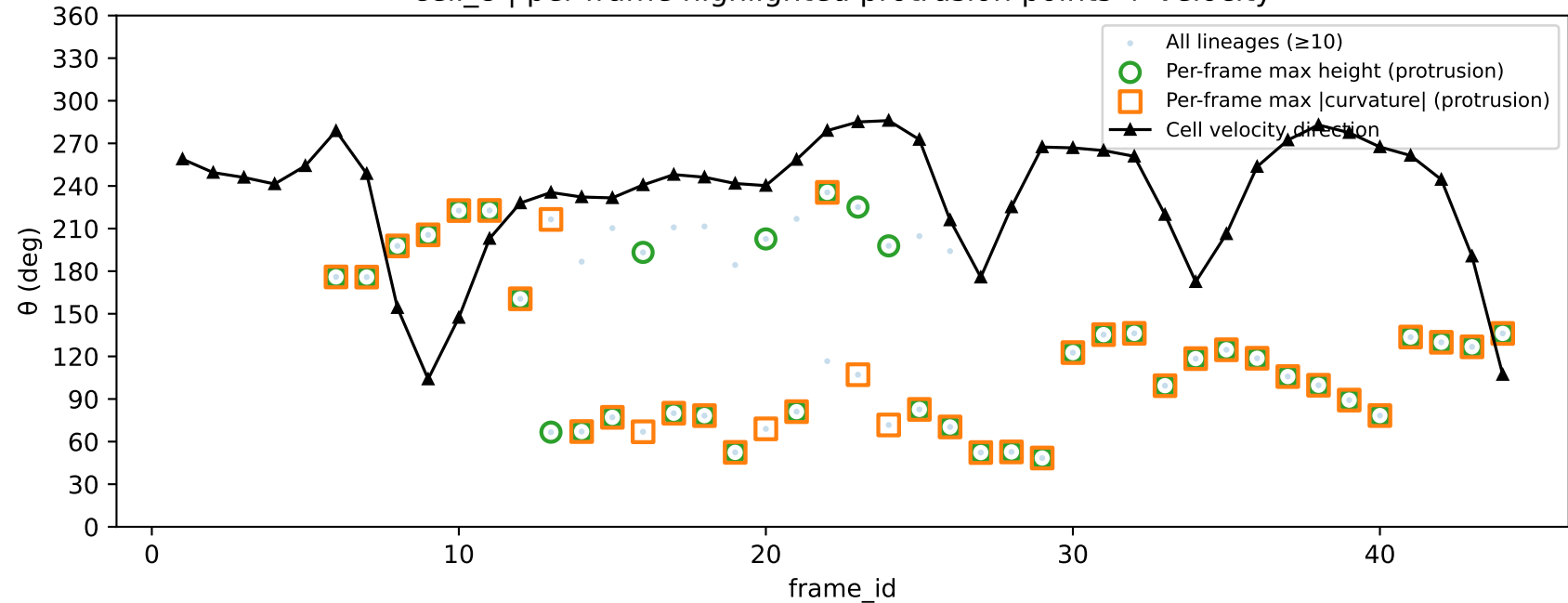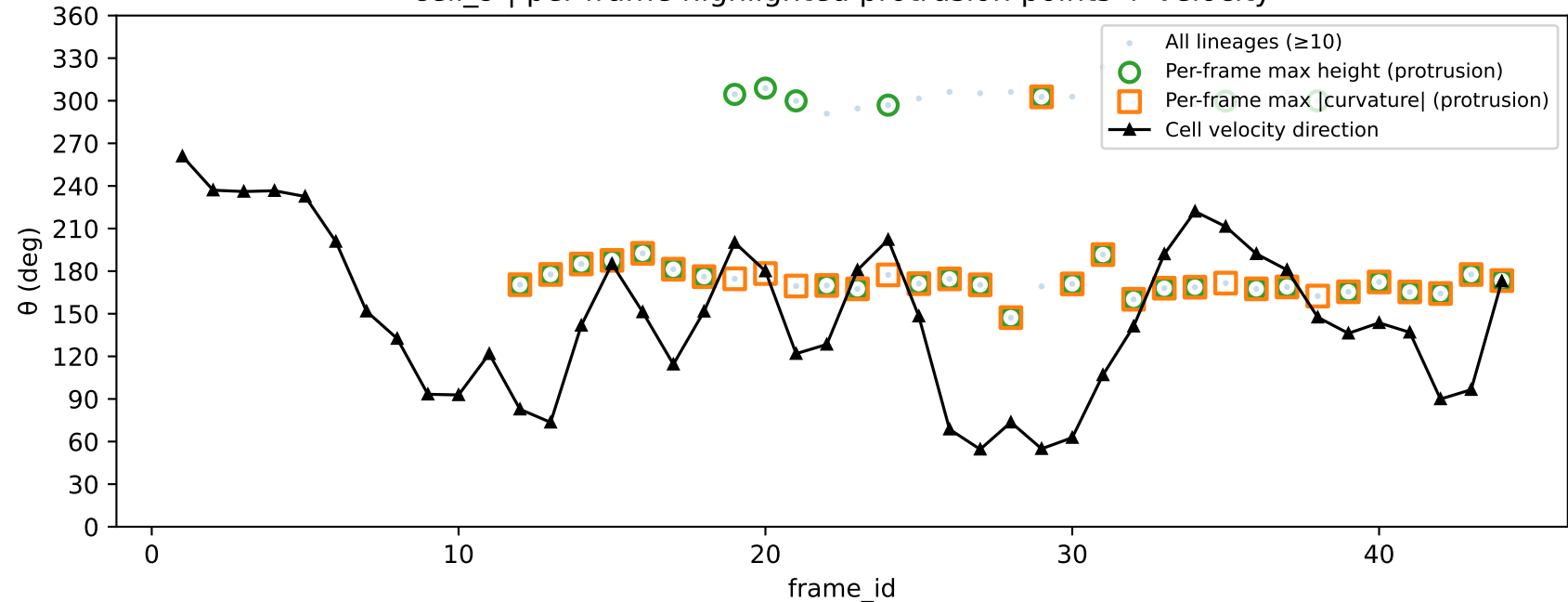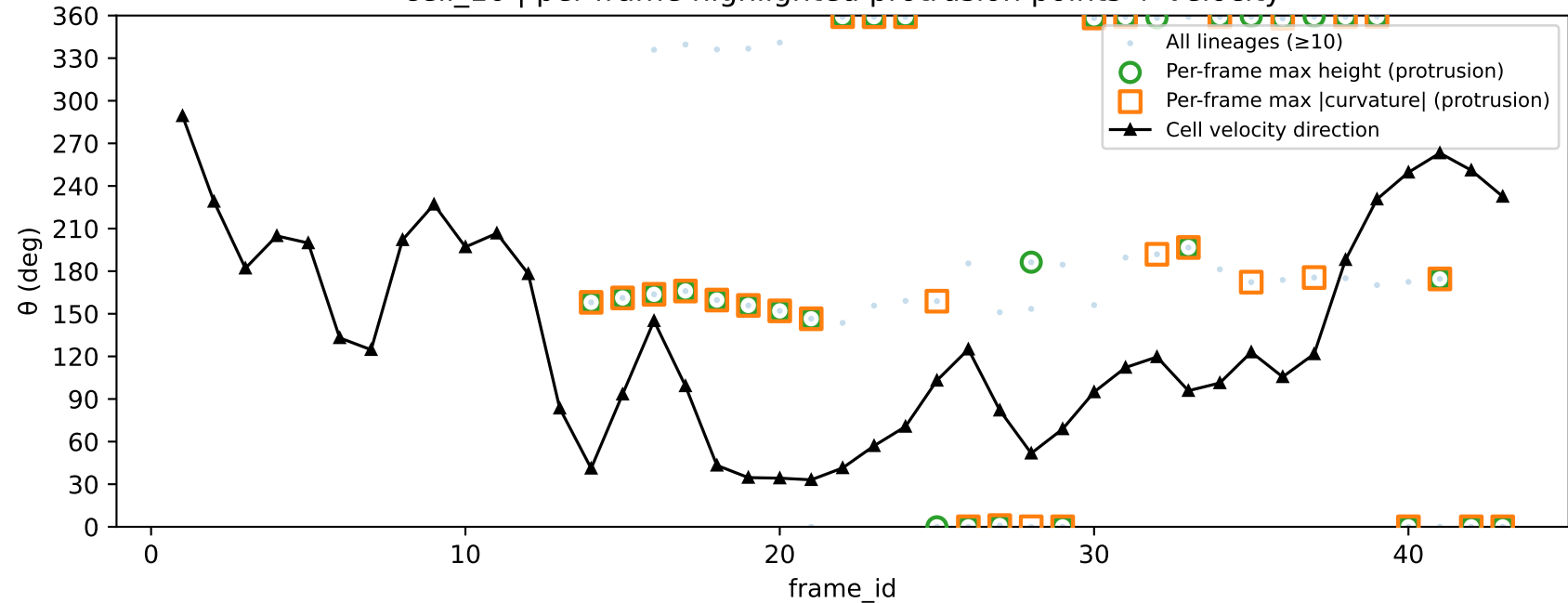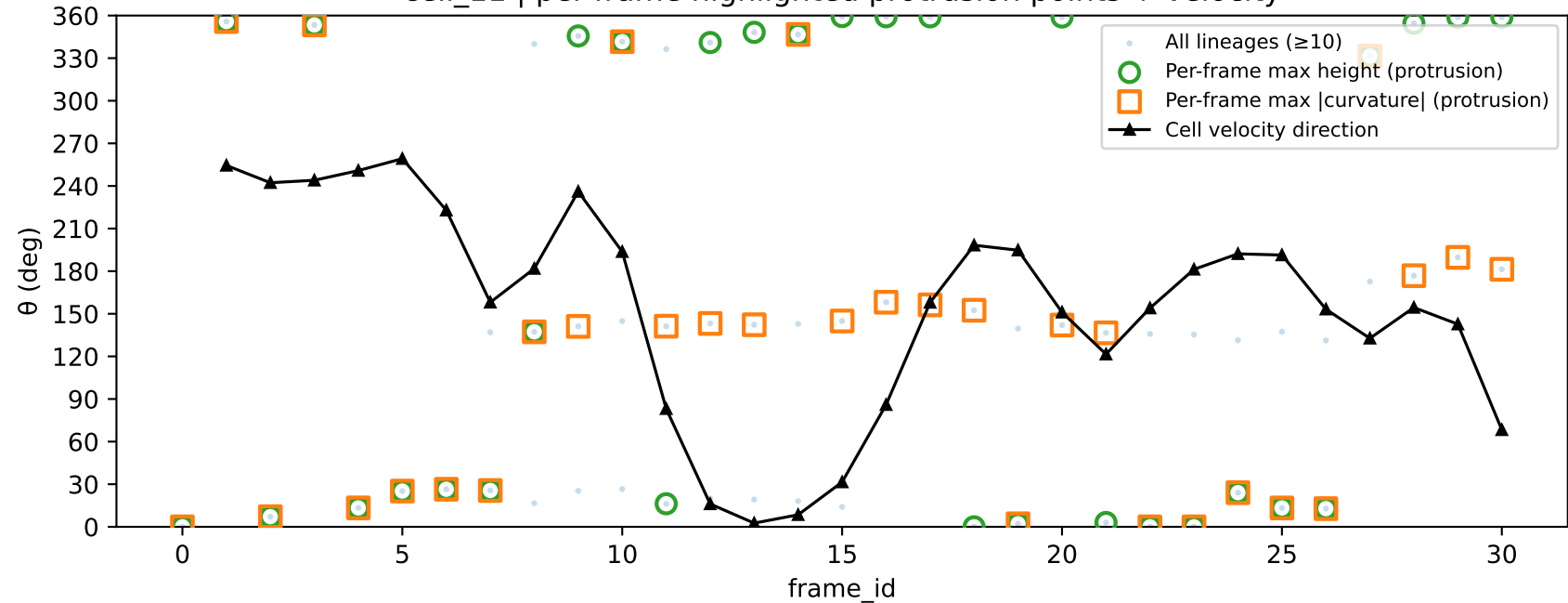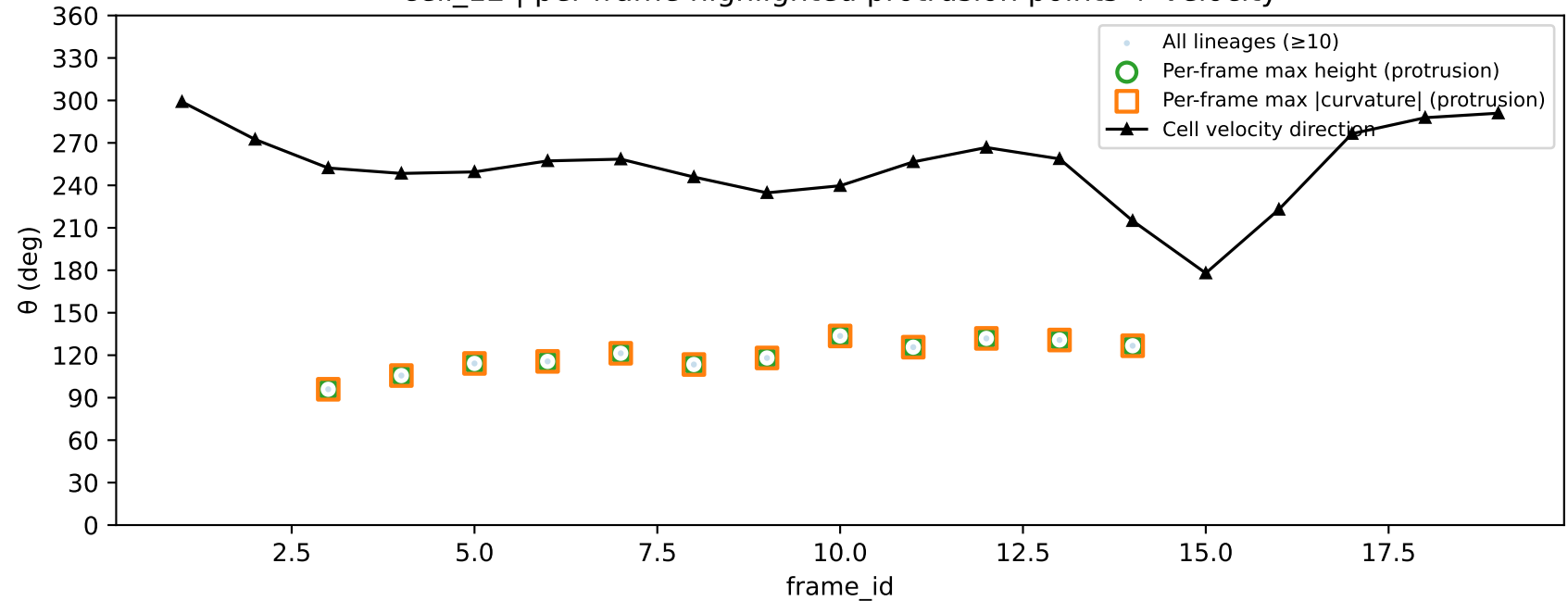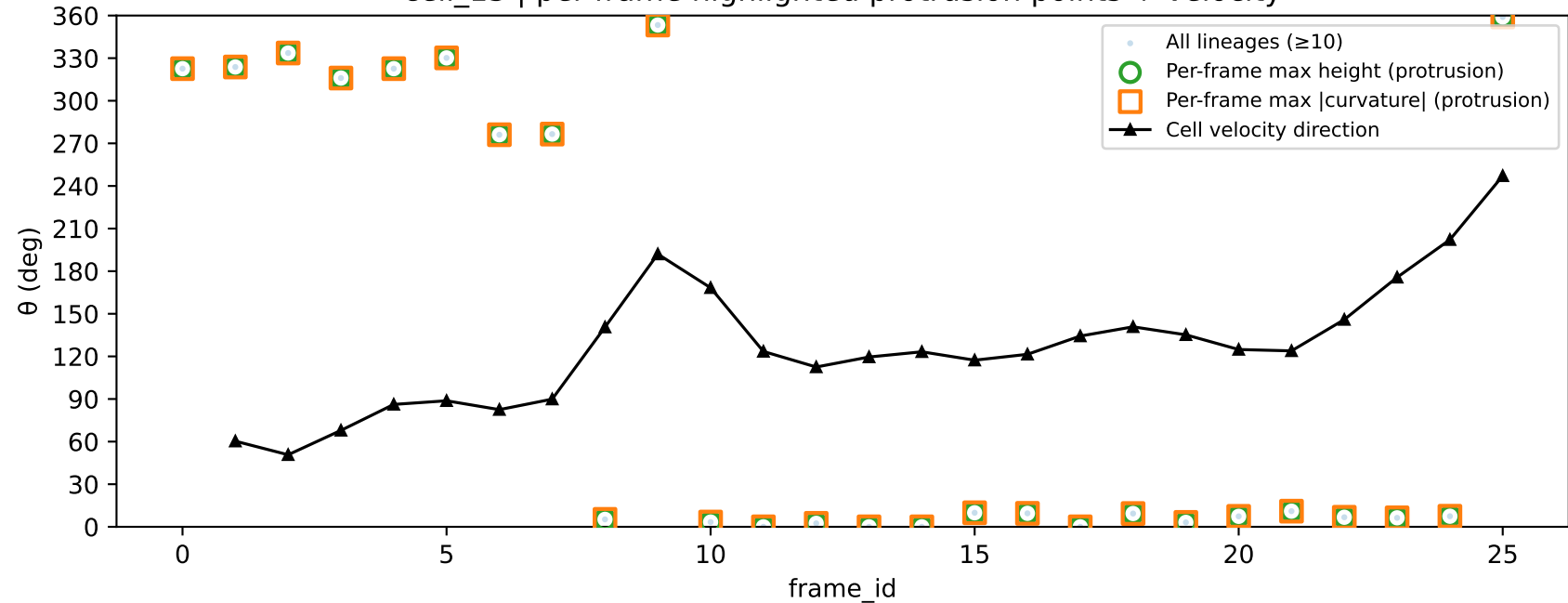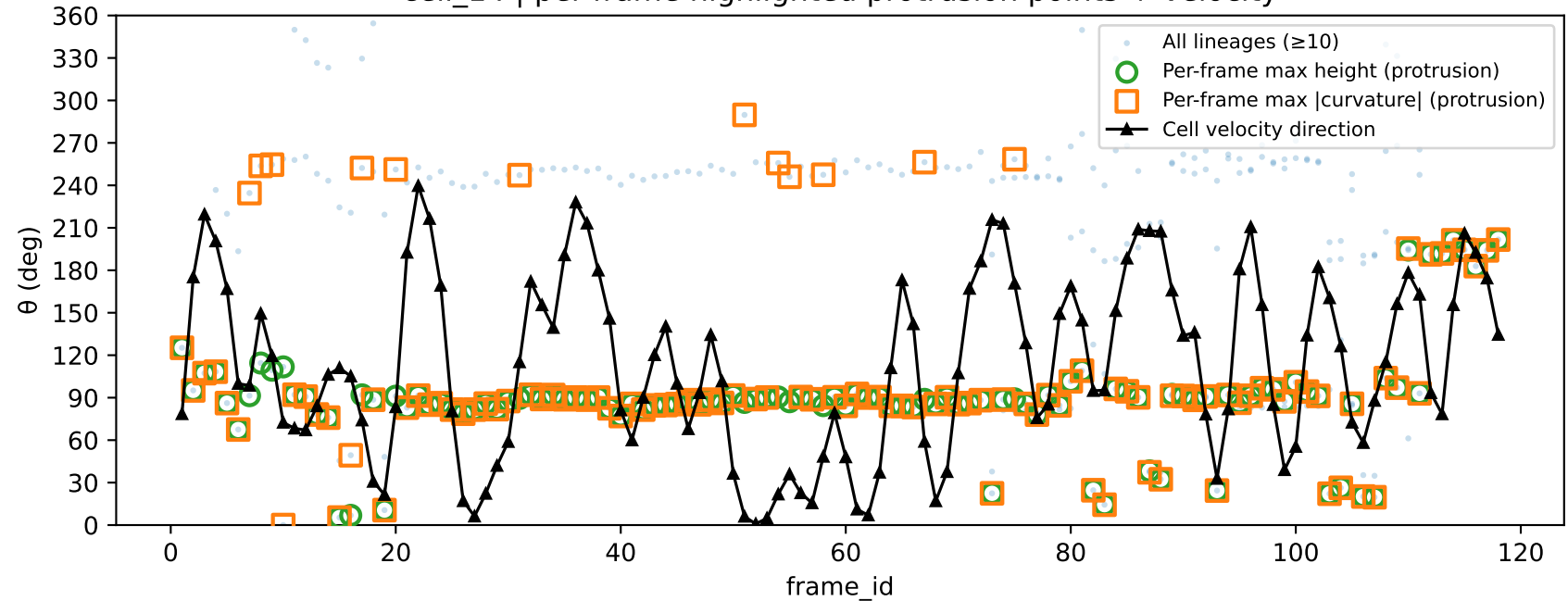cell_10 | per-frame highlighted protrusion points + velocity

- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

cell_11 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

cell_12 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

x-axis: frame_id
y-axis: θ (deg)
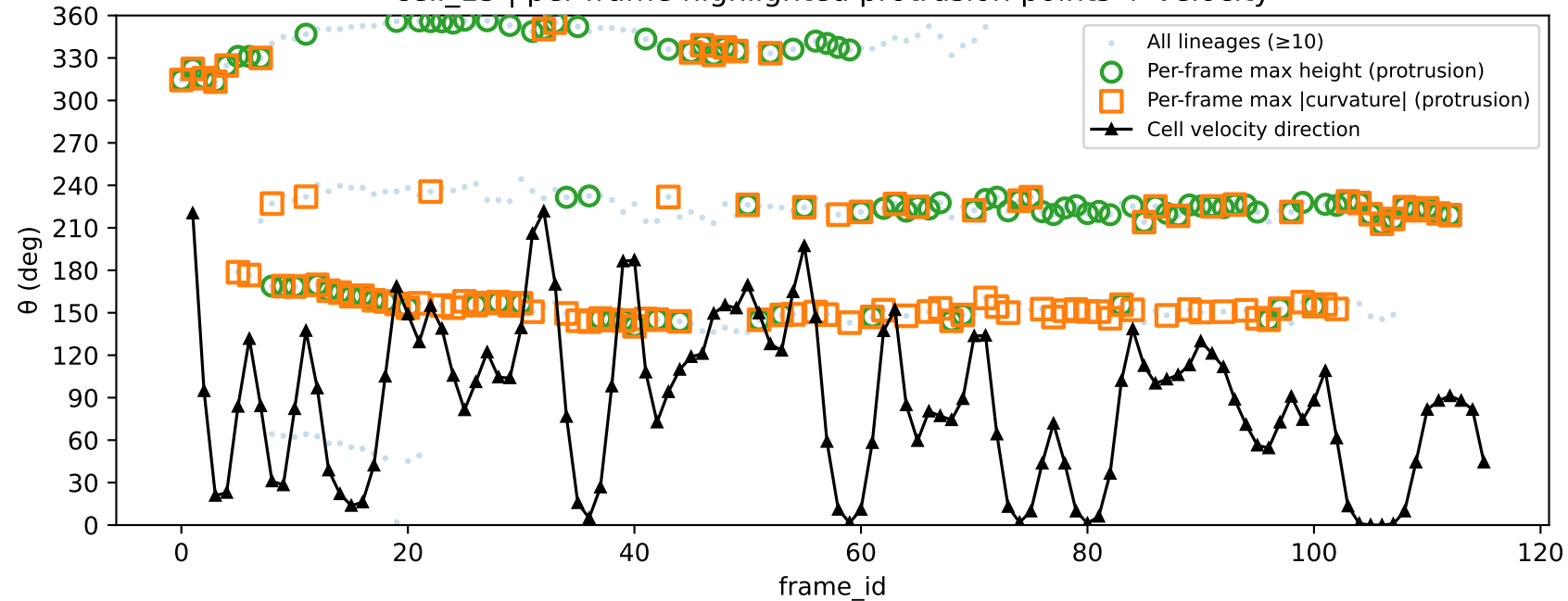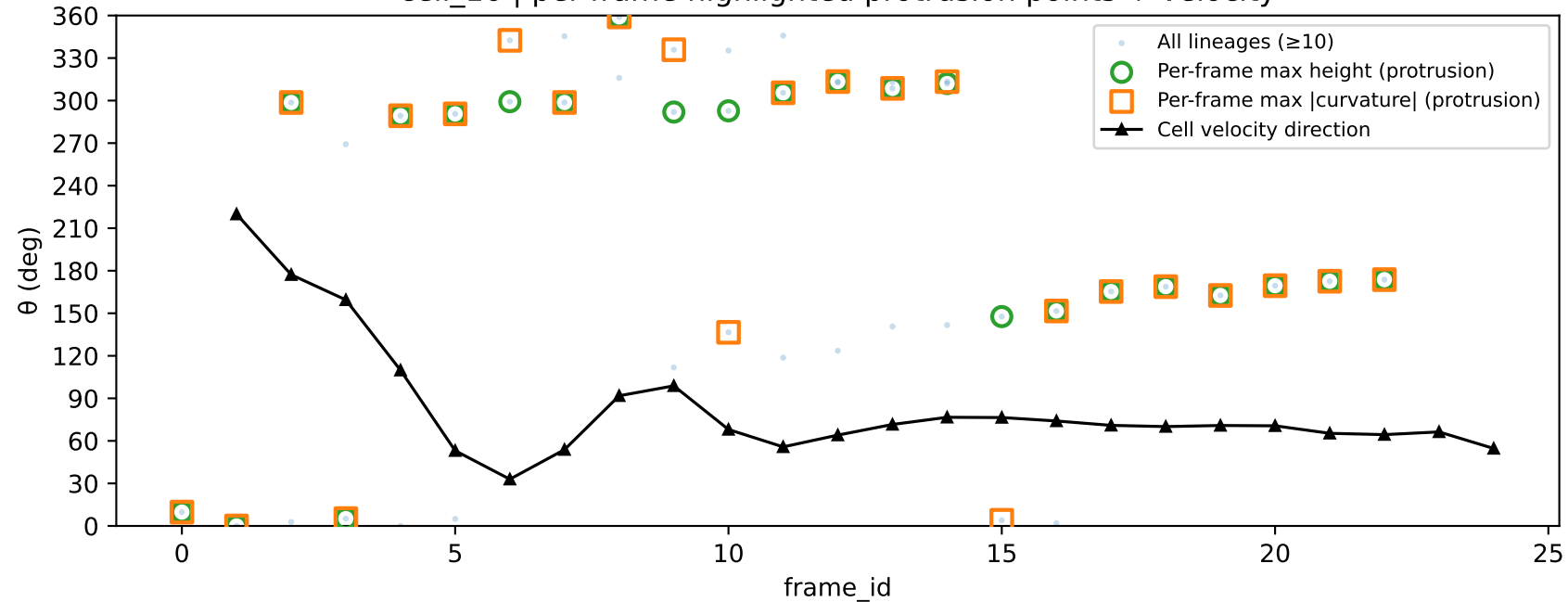
cell_13 | per-frame highlighted protrusion points + velocity

cell_14 | per-frame highlighted protrusion points + velocity

Legend:
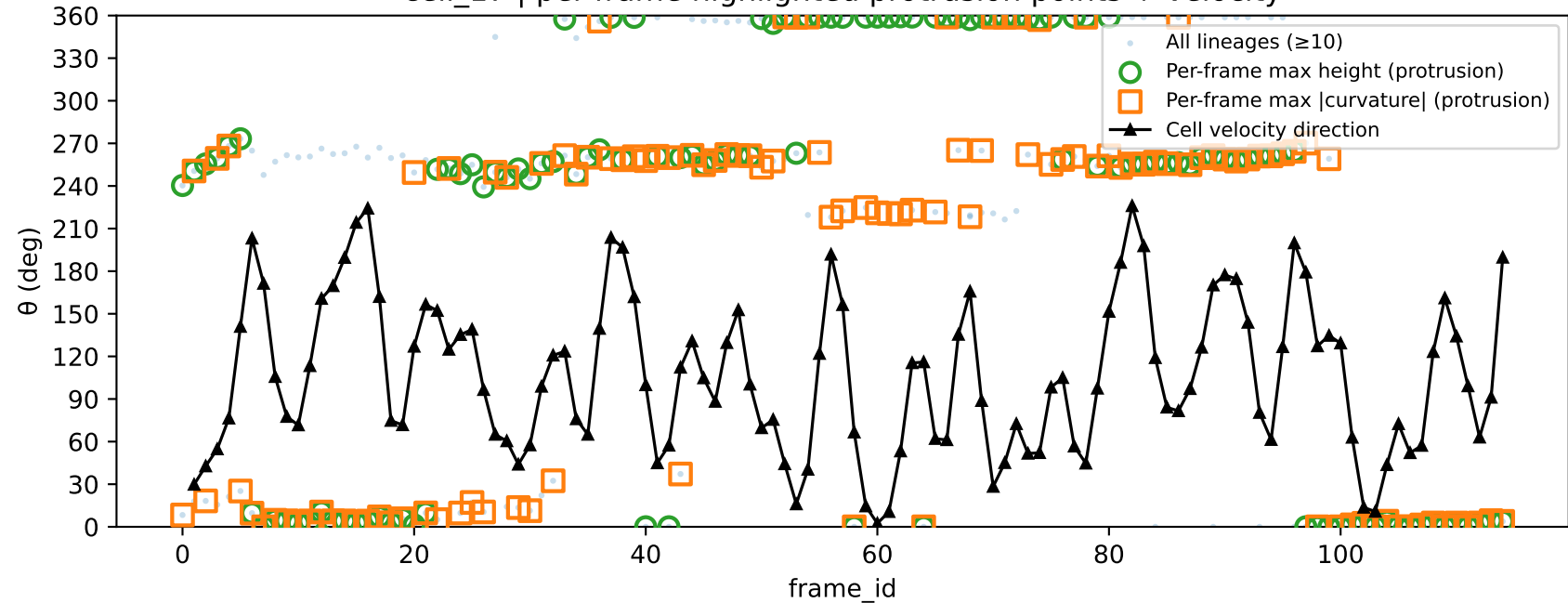- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

X-axis: frame_id

Y-axis: θ (deg)

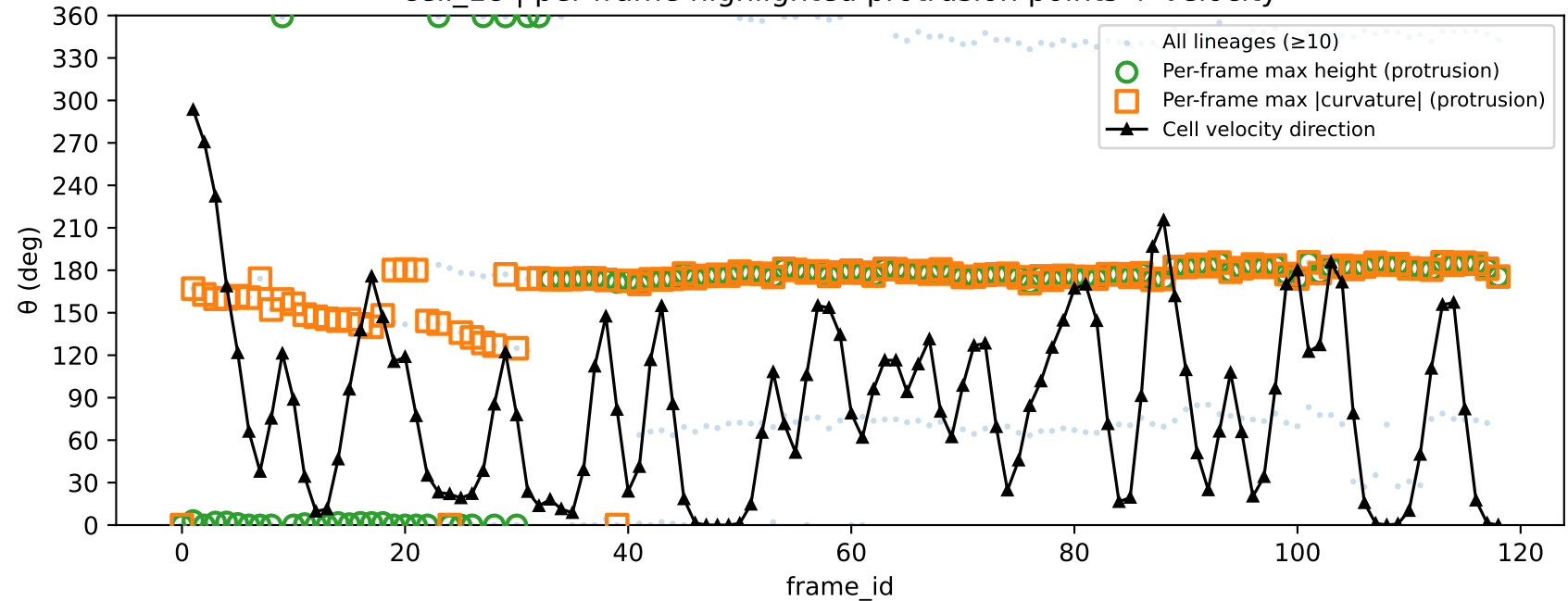cell_15 | per-frame highlighted protrusion points + velocity

cell_16 | per-frame highlighted protrusion points + velocity

Legend:
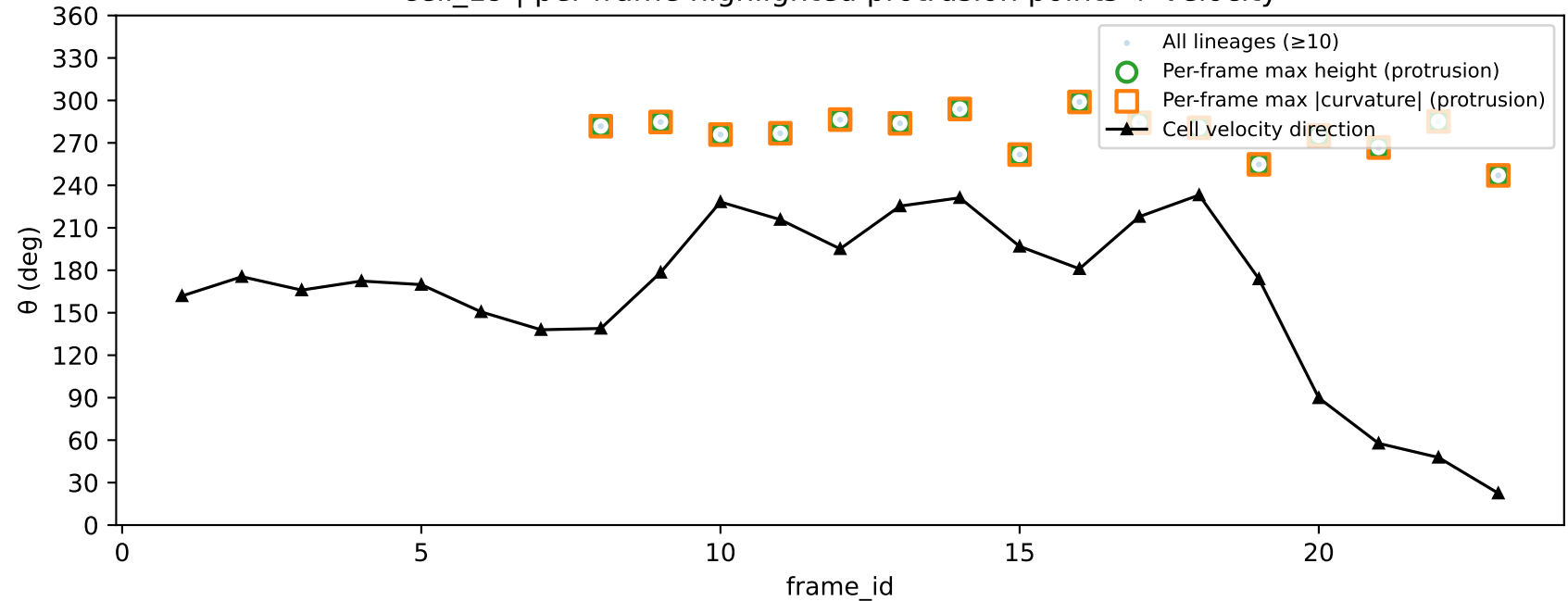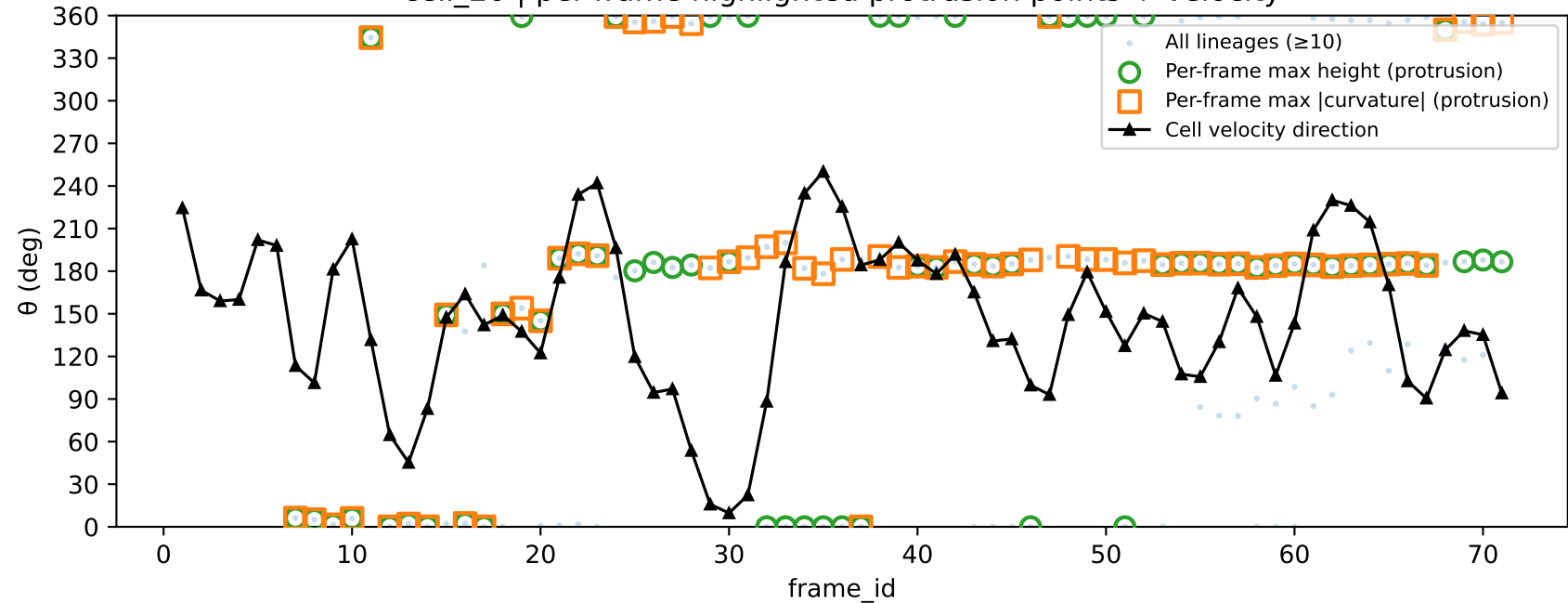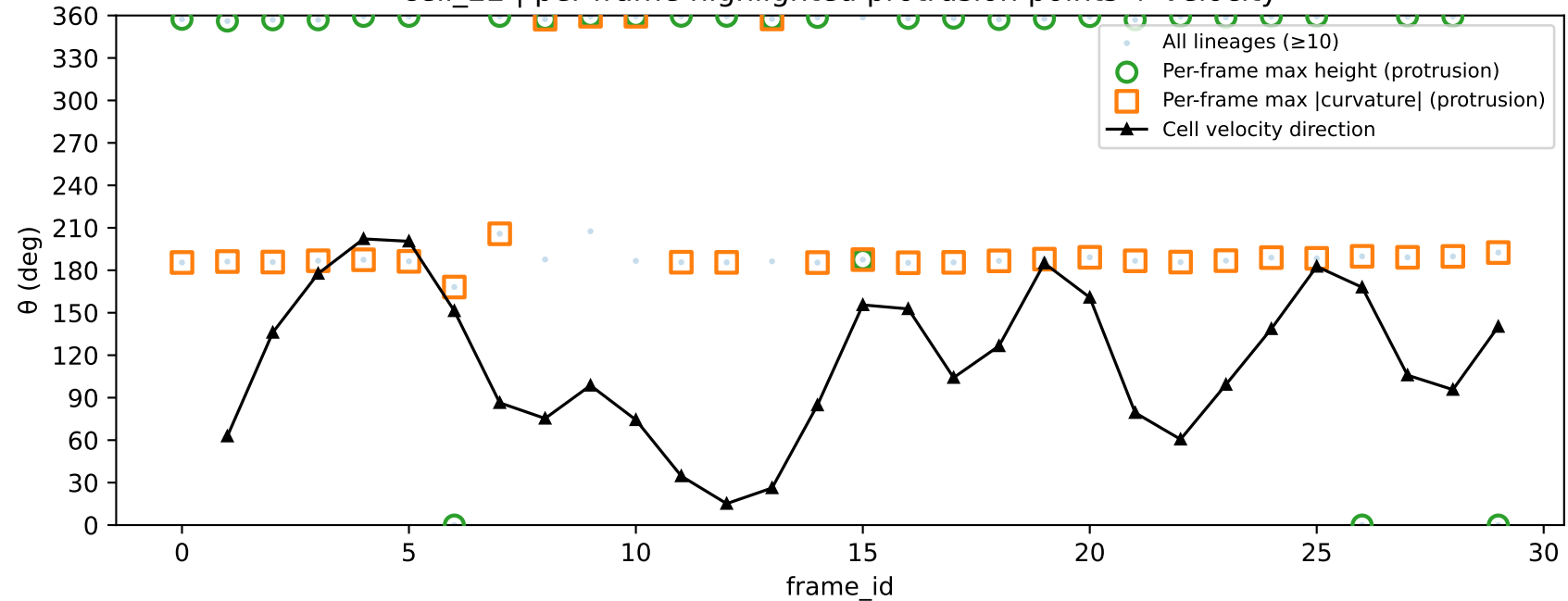- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

cell_17 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

Y-axis: θ (deg)
X-axis: frame_id

cell_18 | per-frame highlighted protrusion points + velocity

- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

cell_19 | per-frame highlighted protrusion points + velocity

cell_20 | per-frame highlighted protrusion points + velocity

- All lineages (≥10)
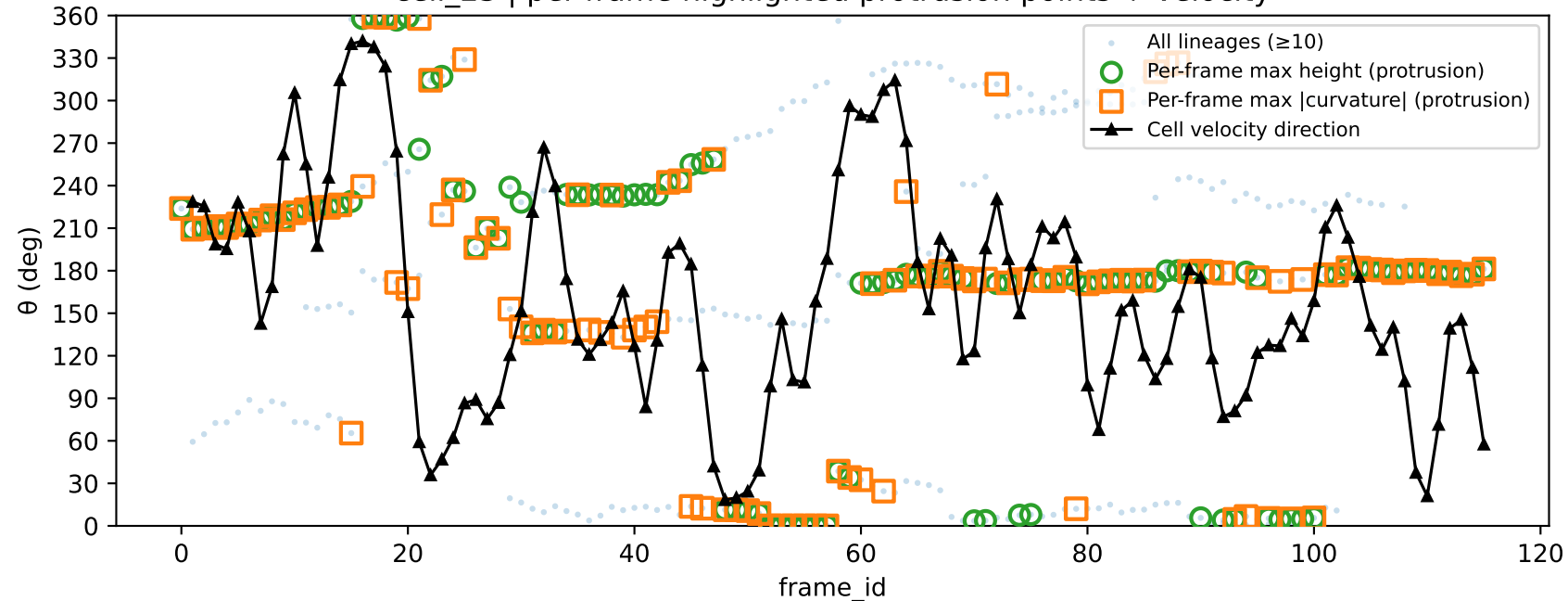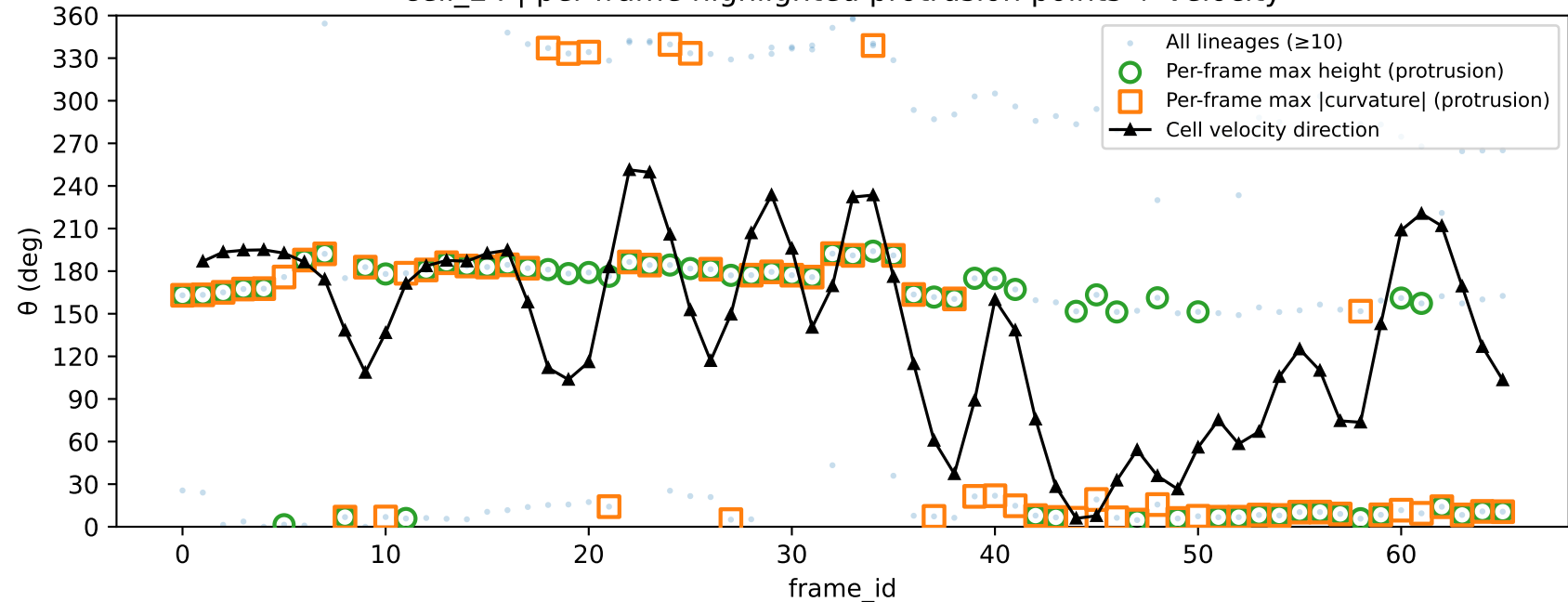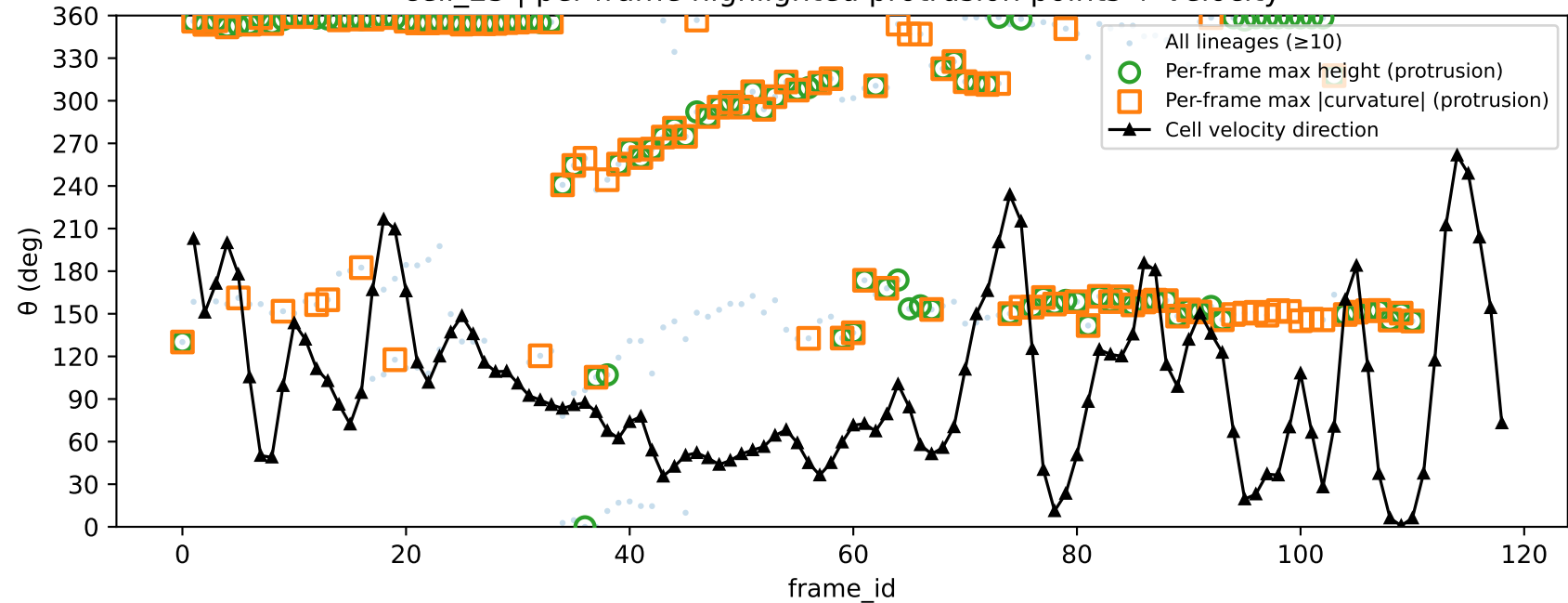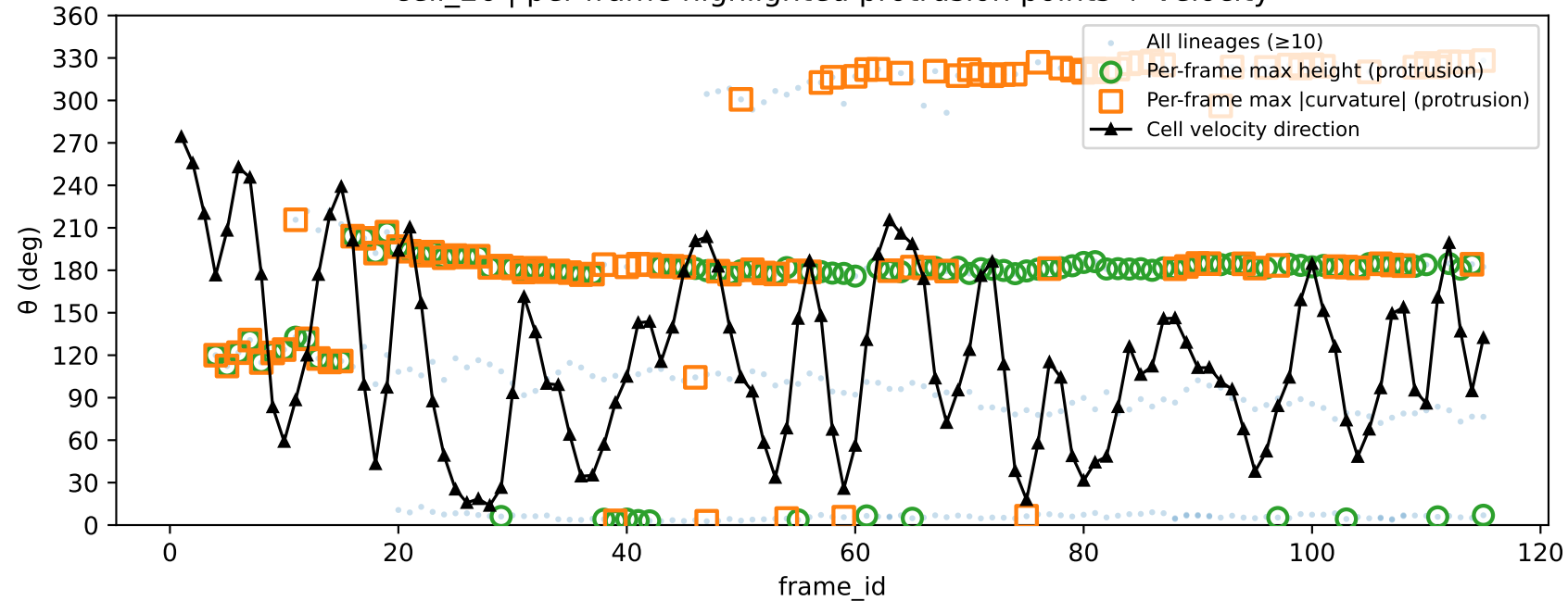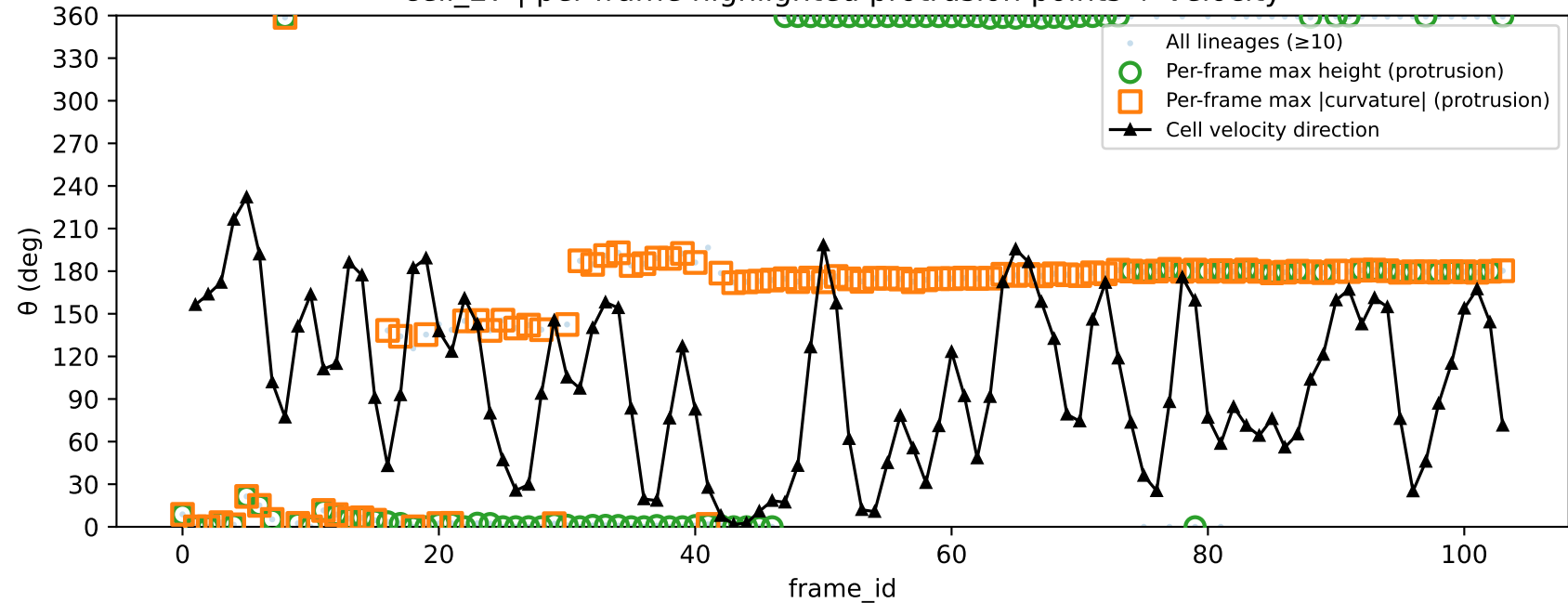- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

cell_22 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

cell_23 | per-frame highlighted protrusion points + velocity

cell_24 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

cell_25 | per-frame highlighted protrusion points + velocity

cell_26 | per-frame highlighted protrusion points + velocity

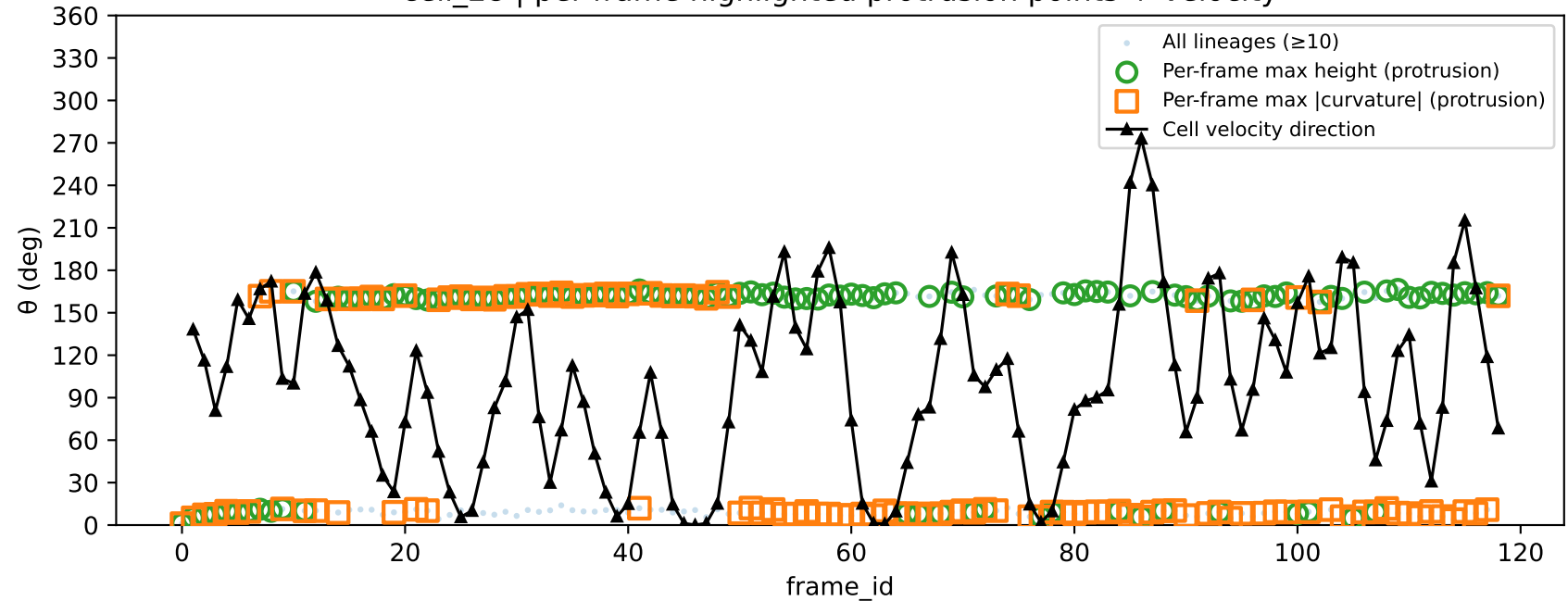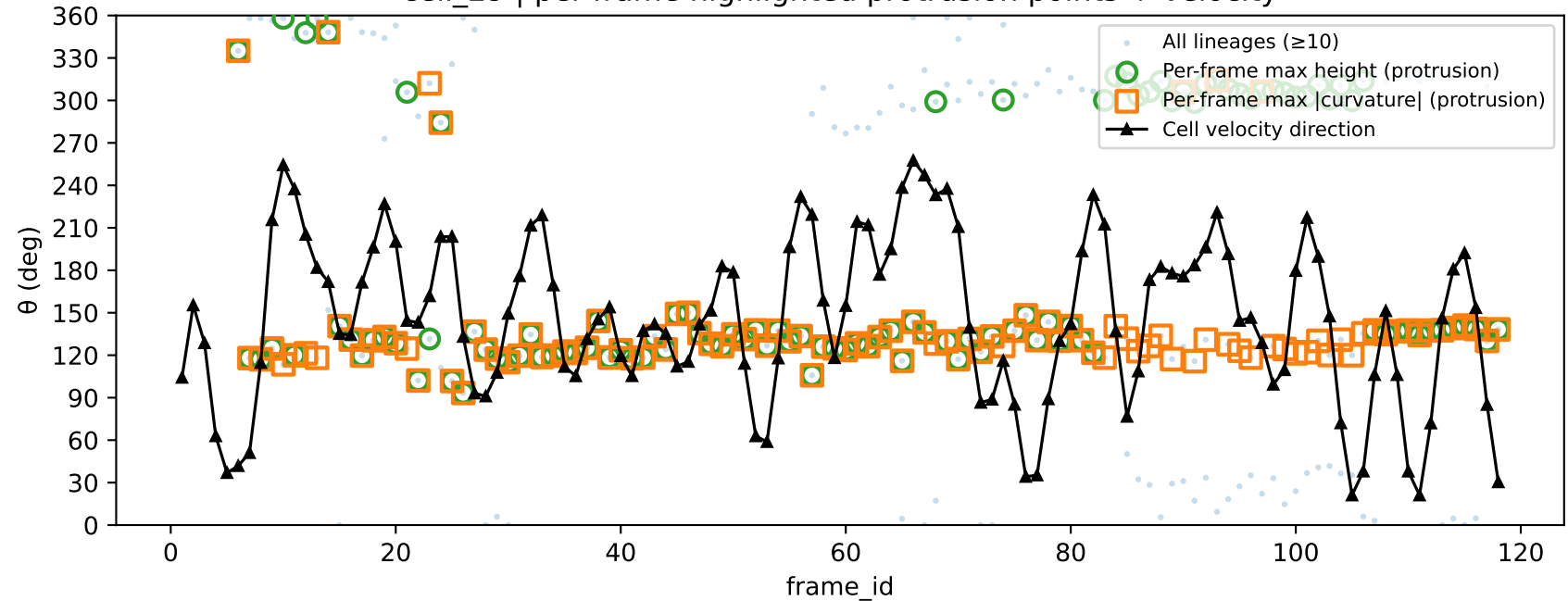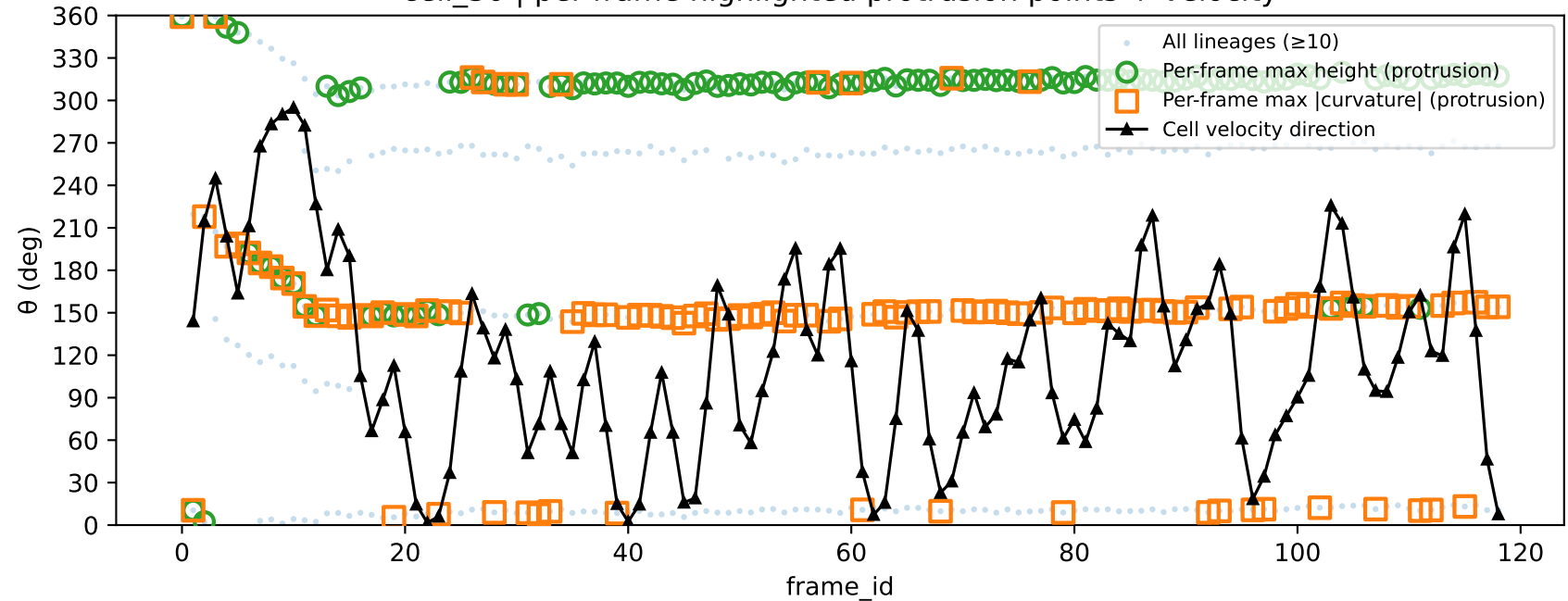cell_27 | per-frame highlighted protrusion points + velocity

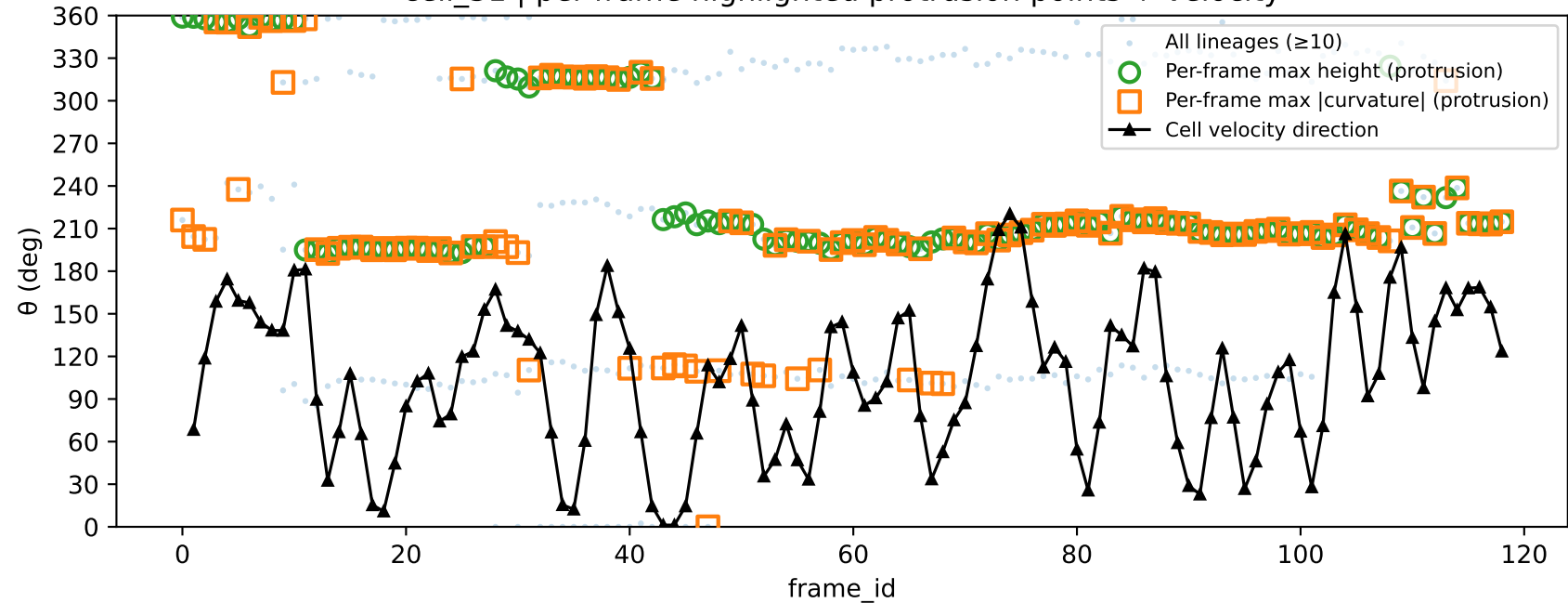cell_28 | per-frame highlighted protrusion points + velocity

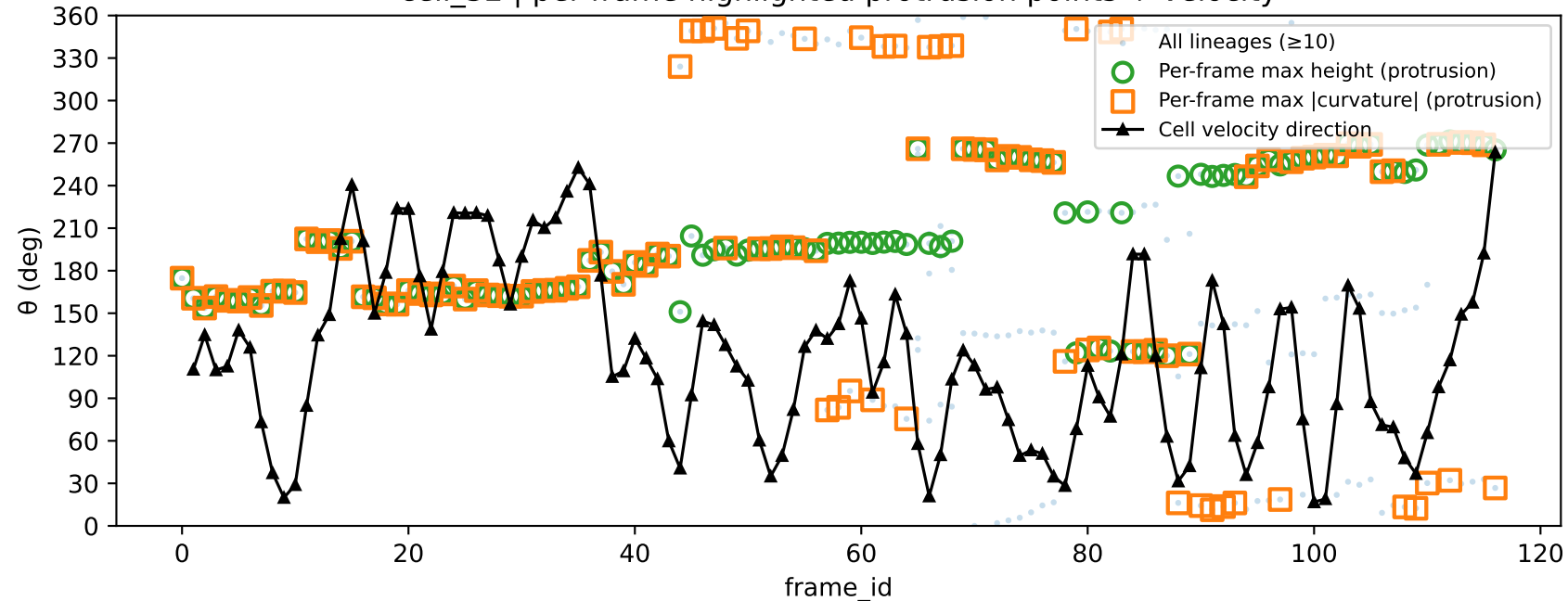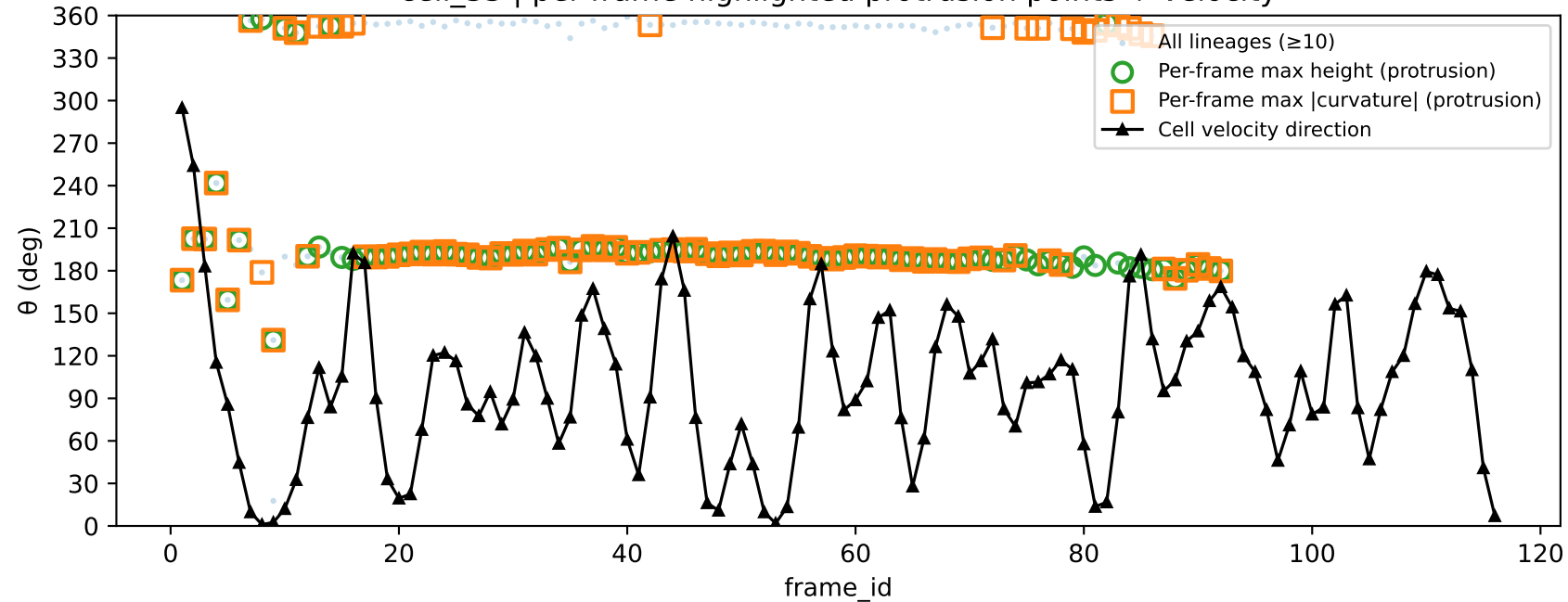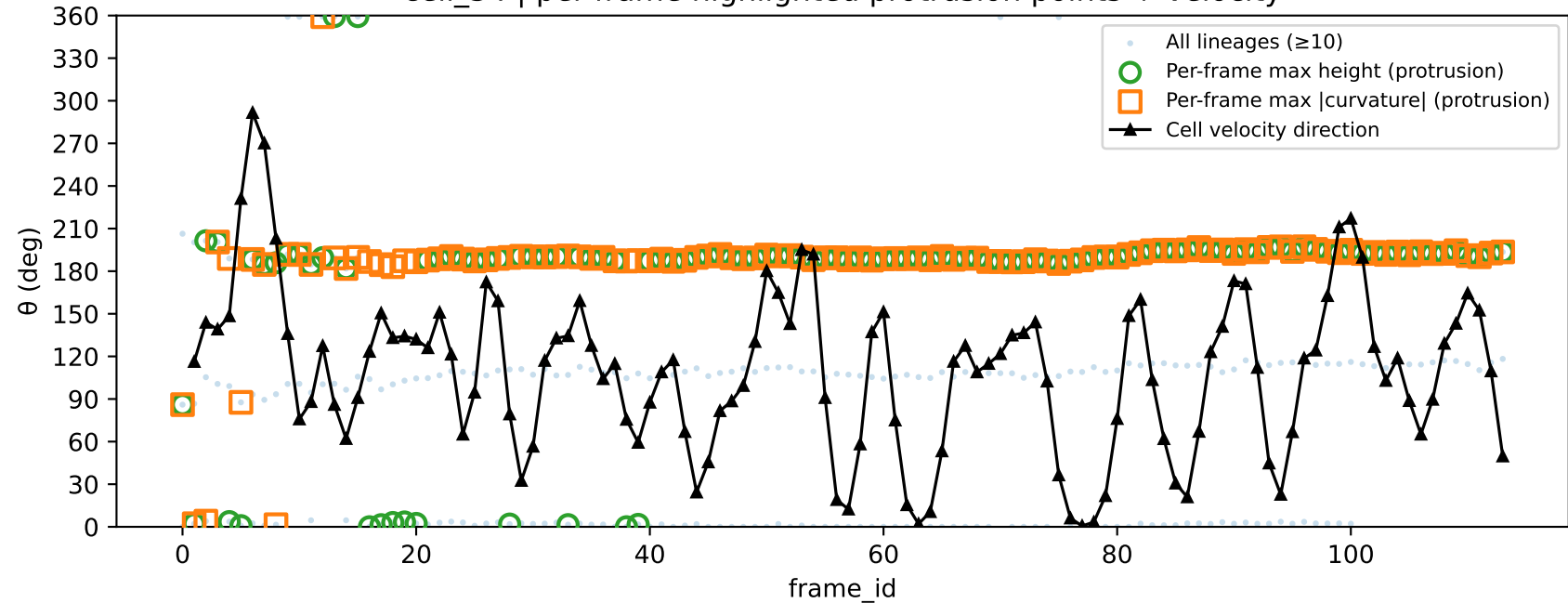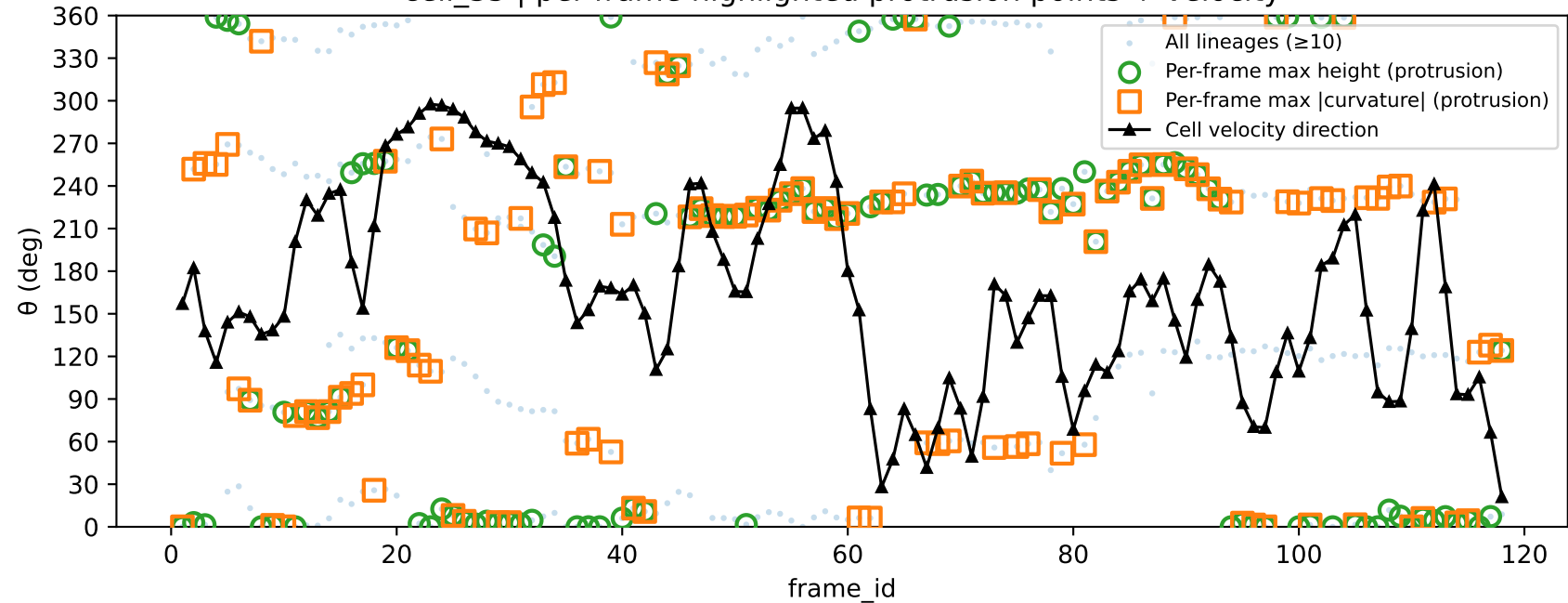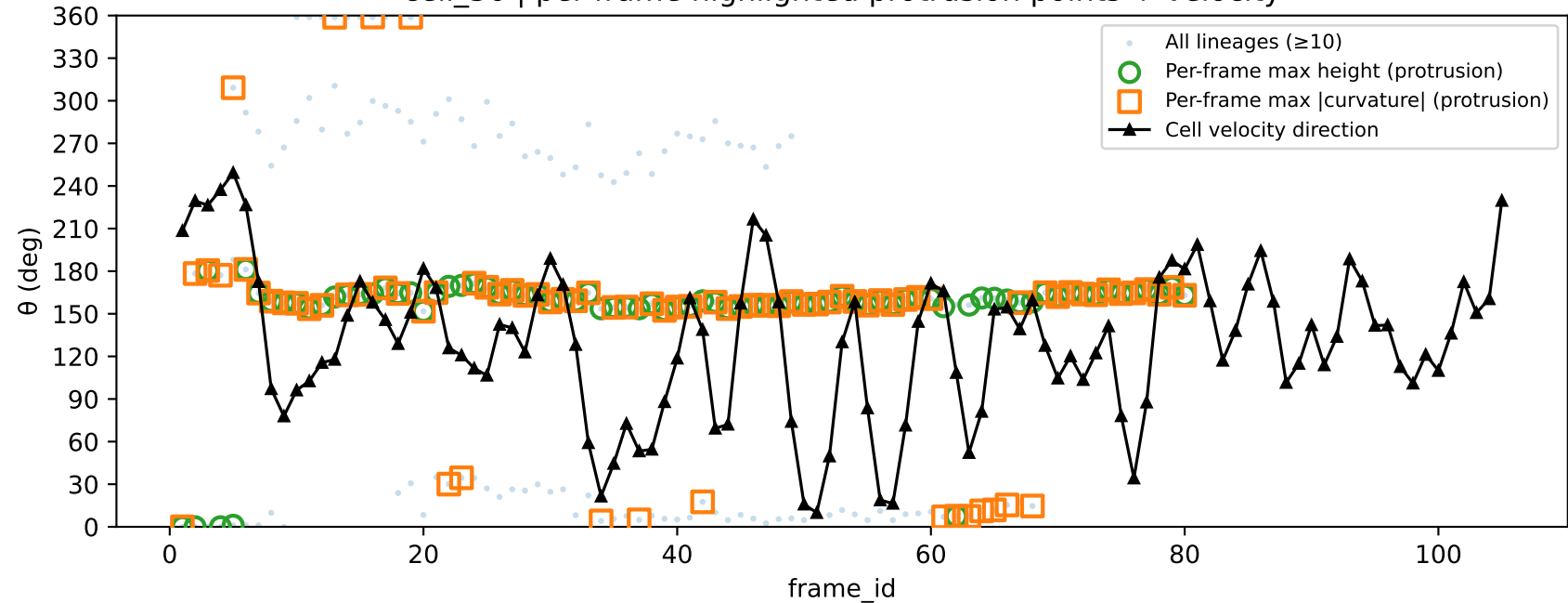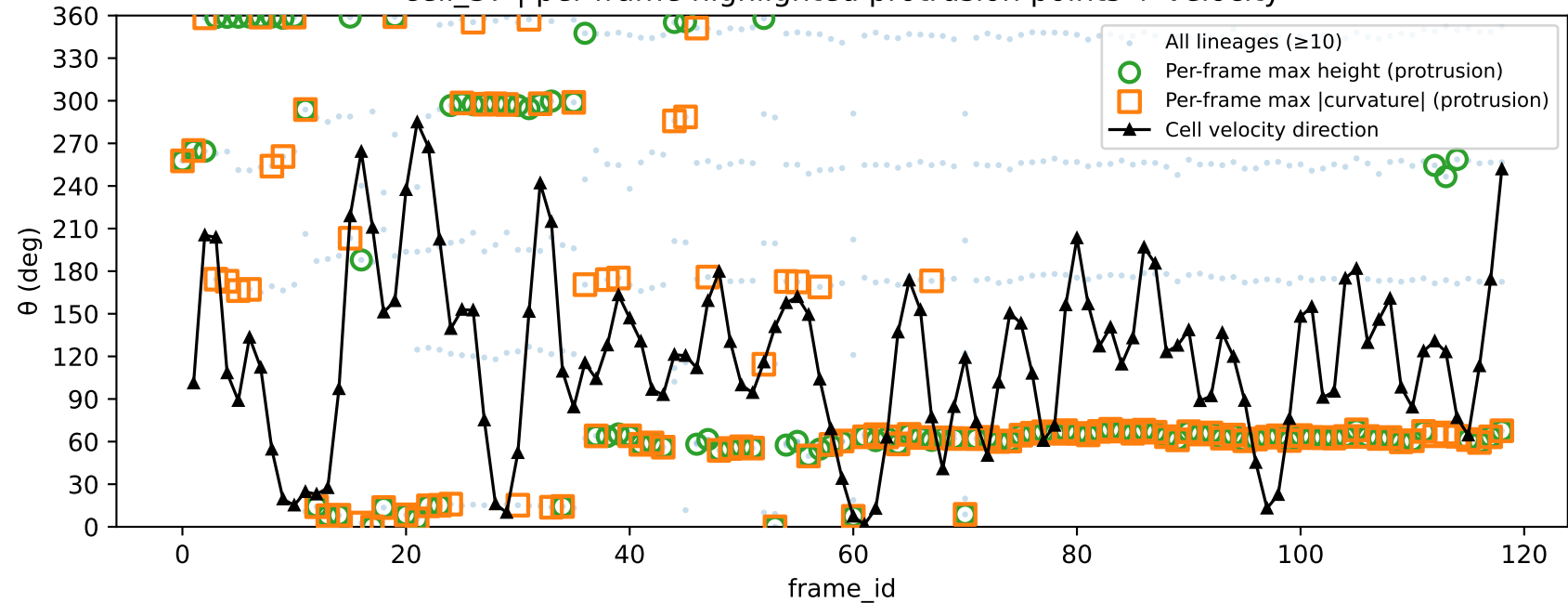cell_29 | per-frame highlighted protrusion points + velocity

- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

cell_30 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

cell_31 | per-frame highlighted protrusion points + velocity

cell_32 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

cell_33 | per-frame highlighted protrusion points + velocity

cell_34 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction
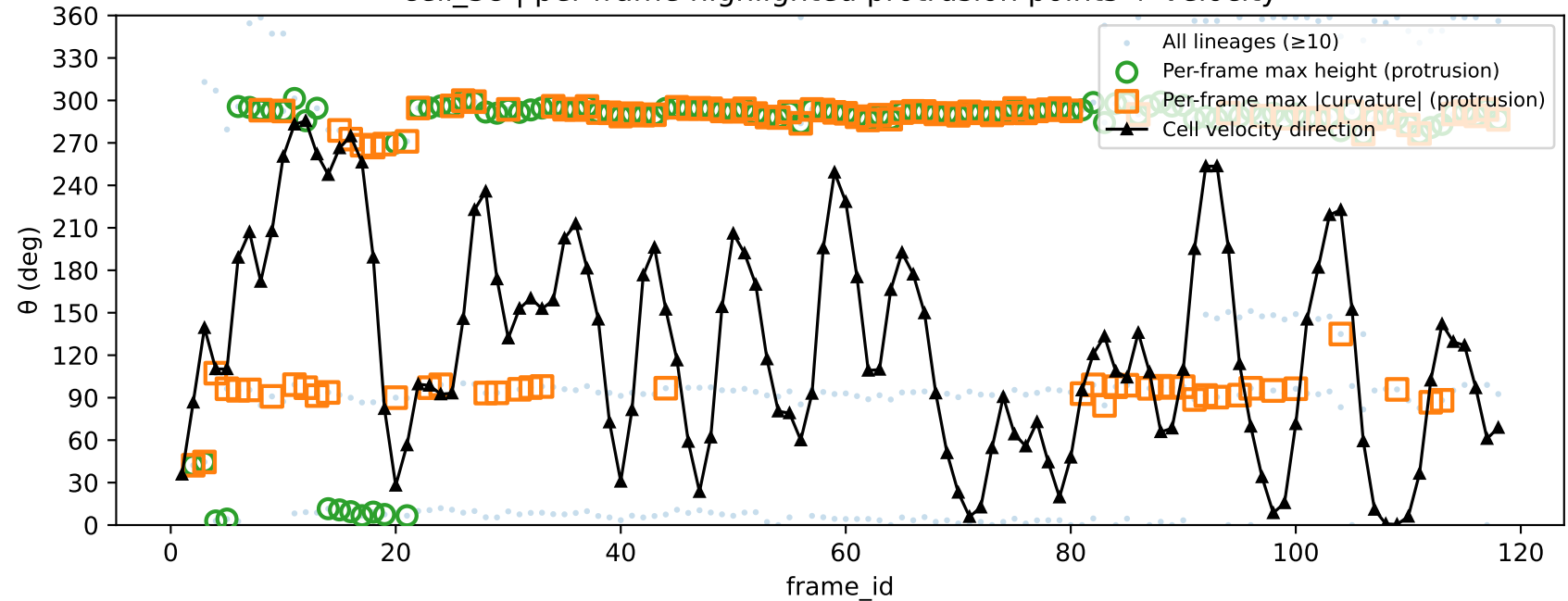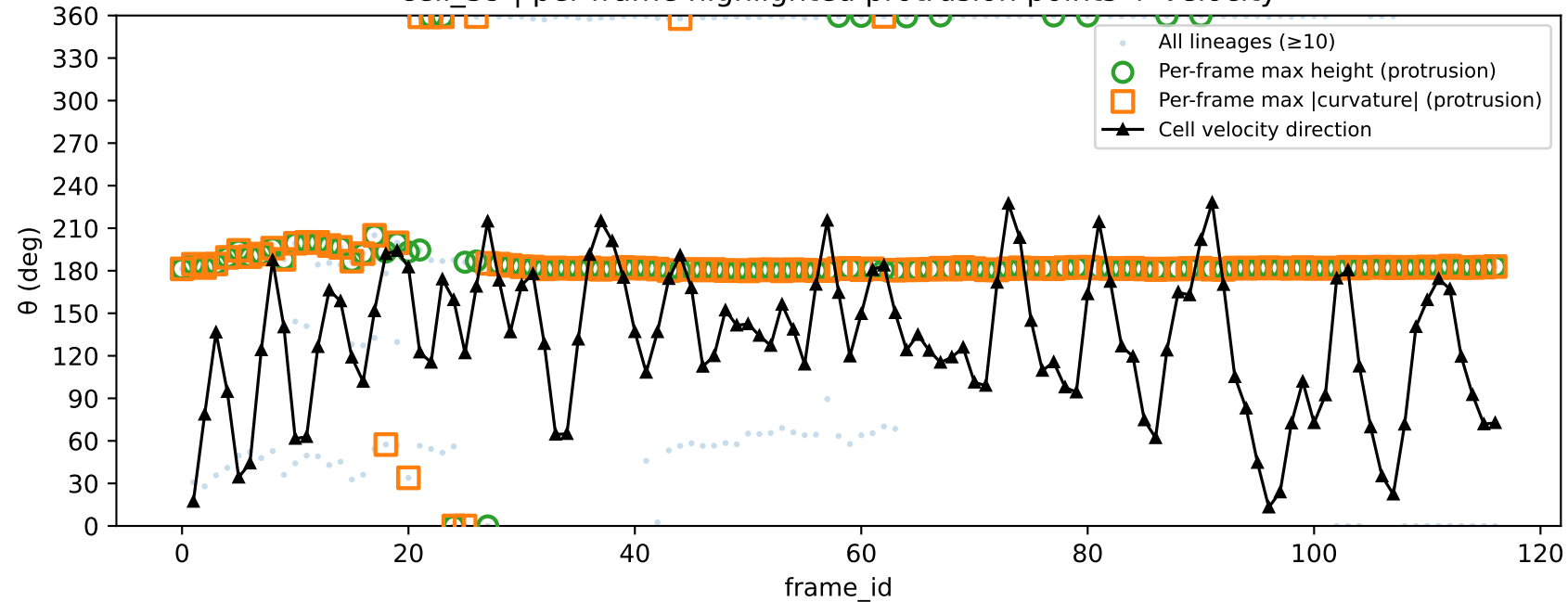
x-axis: frame_id

y-axis: θ (deg)

cell_35 | per-frame highlighted protrusion points + velocity

cell_36 | per-frame highlighted protrusion points + velocity

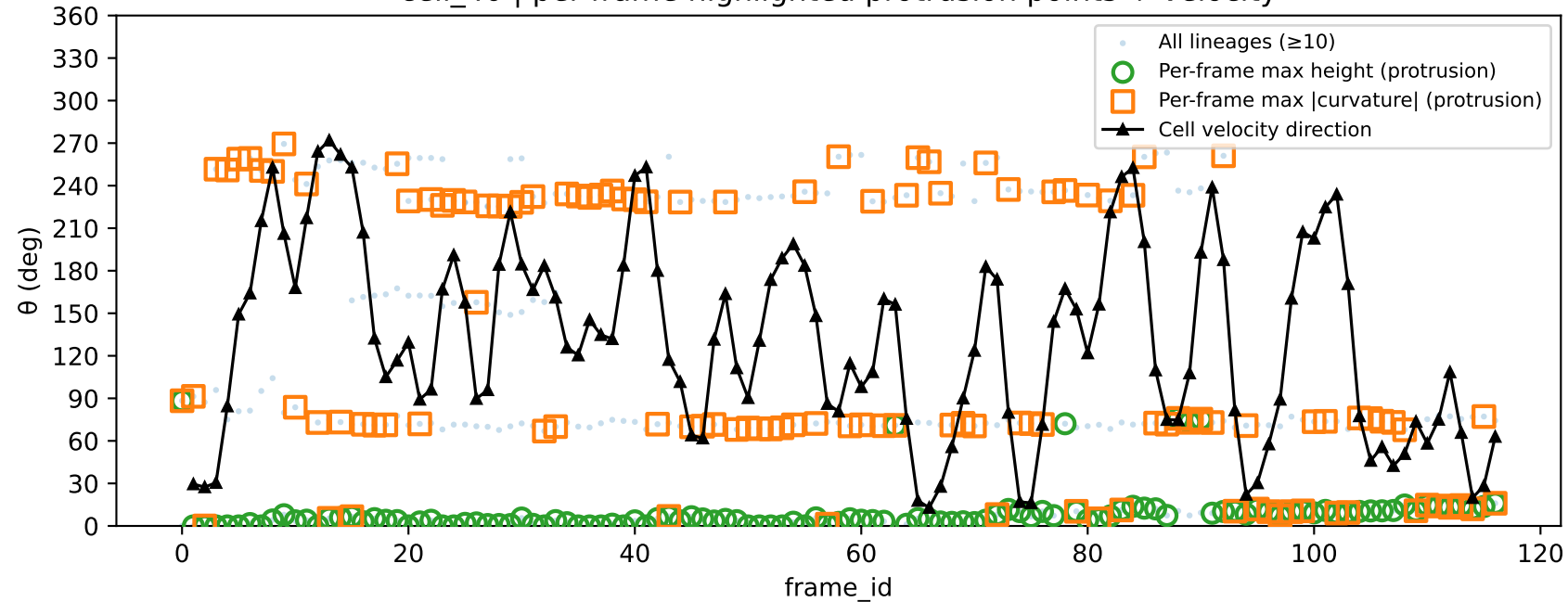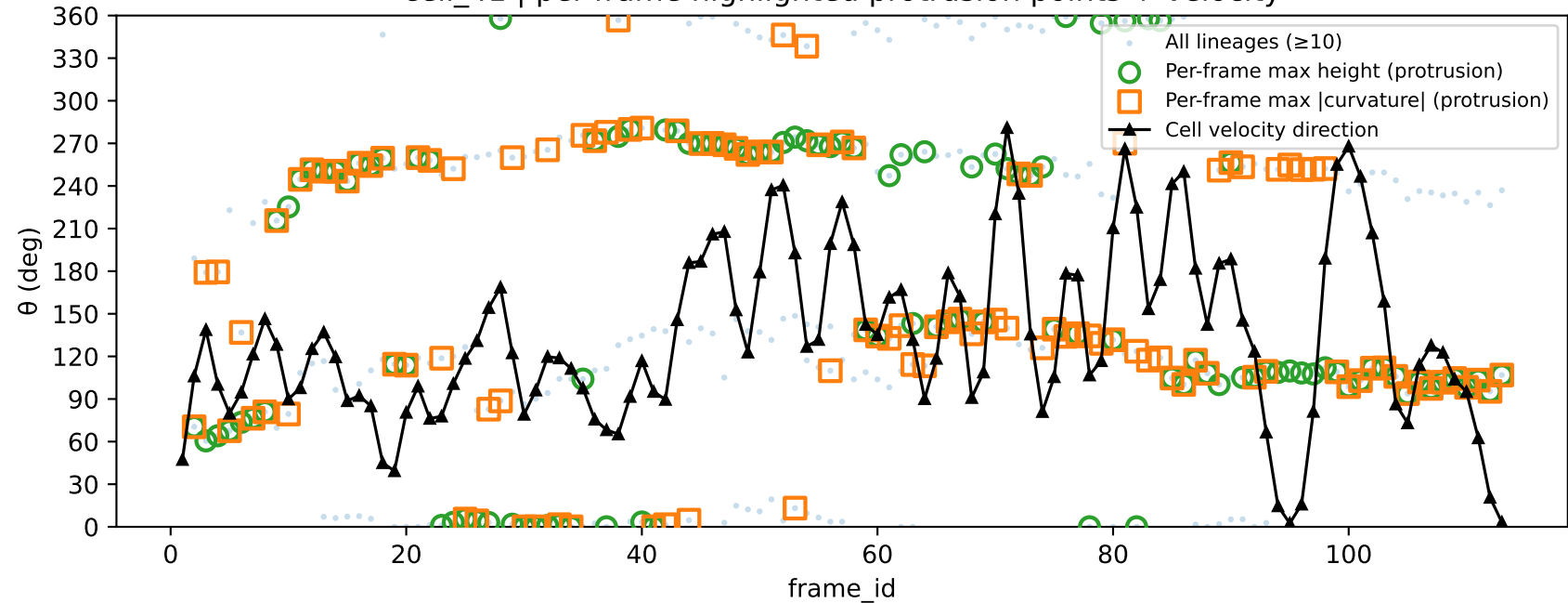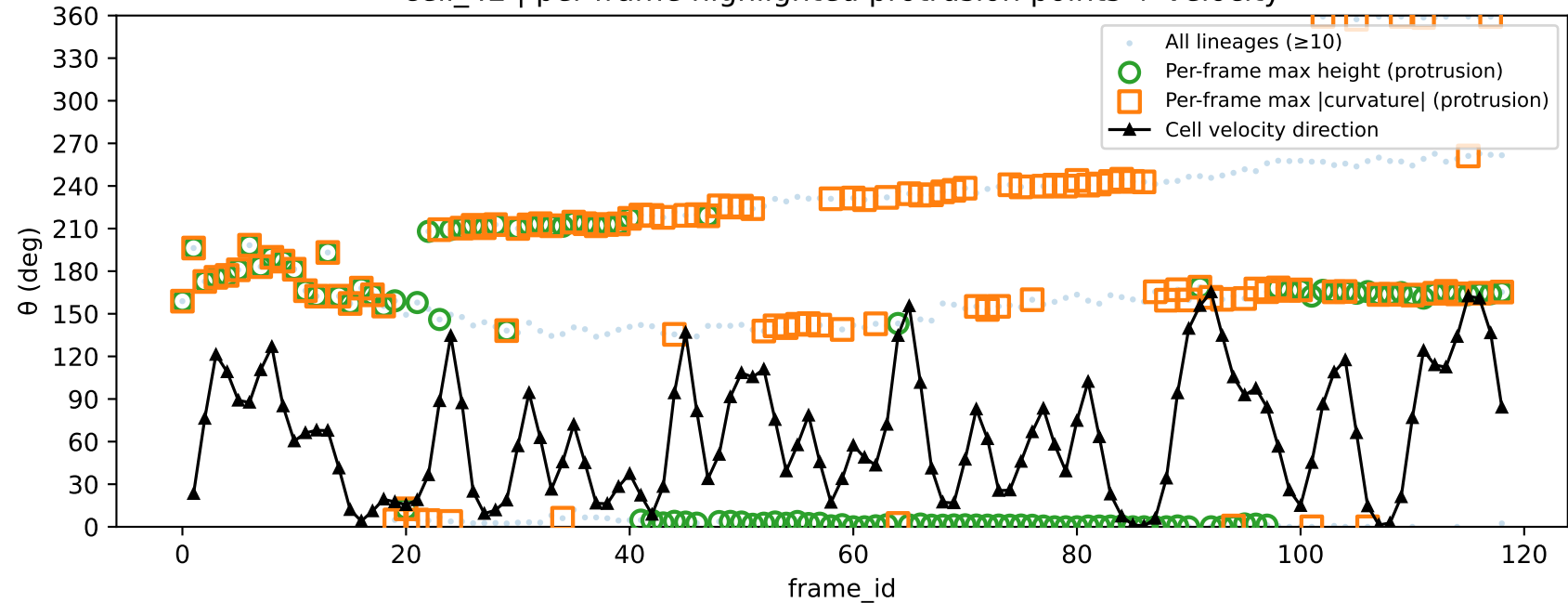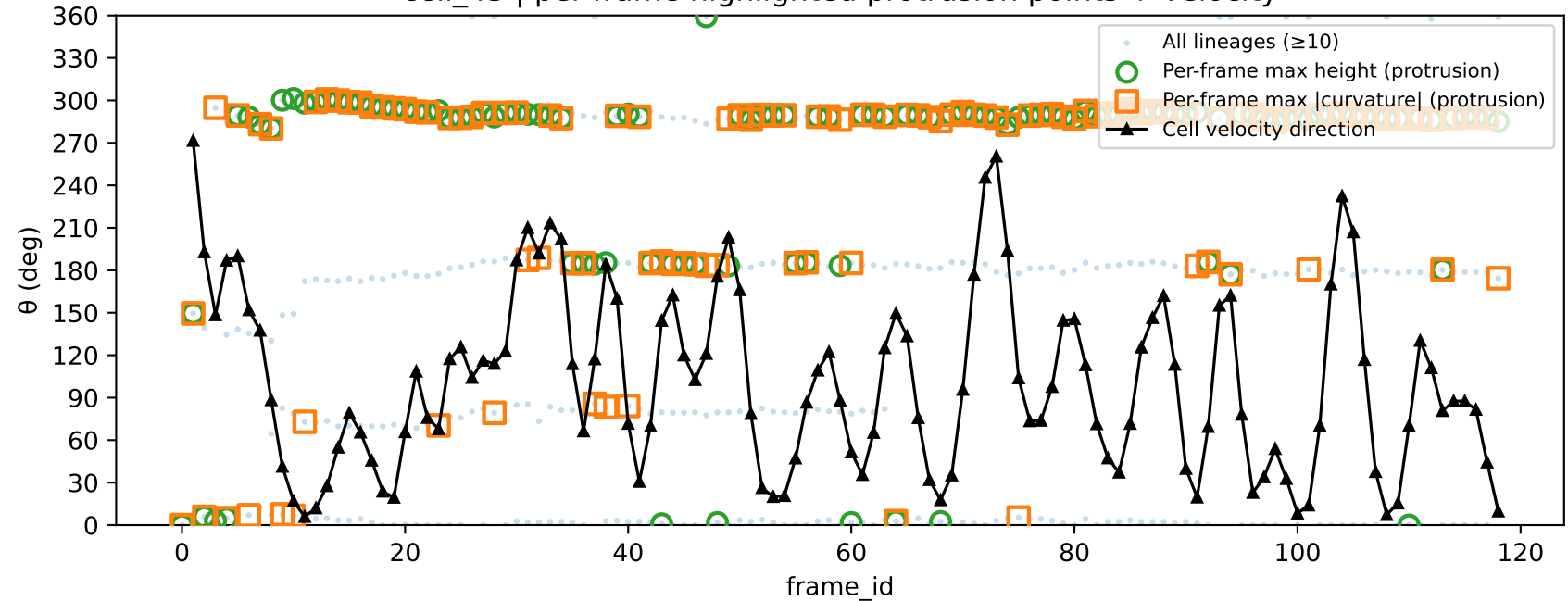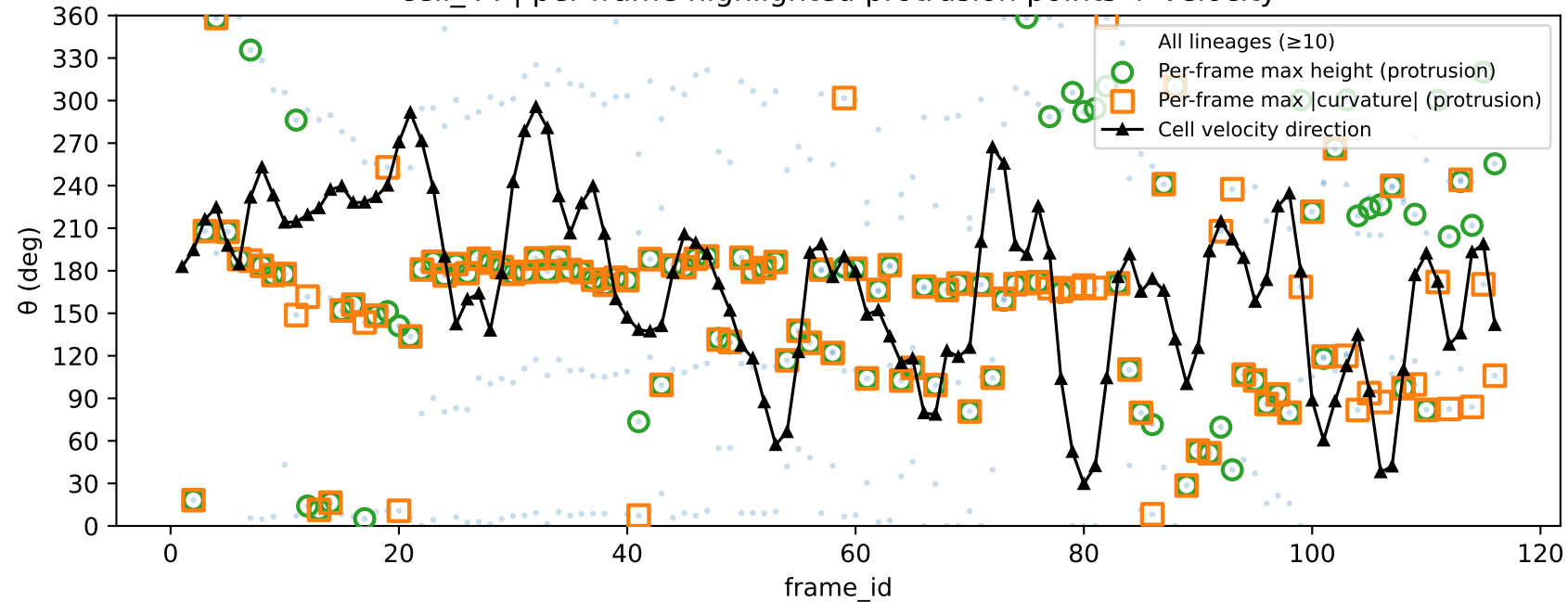cell_37 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

x-axis: frame_id

y-axis: θ (deg)

cell_38 | per-frame highlighted protrusion points + velocity

cell_39 | per-frame highlighted protrusion points + velocity

cell_40 | per-frame highlighted protrusion points + velocity

cell_41 | per-frame highlighted protrusion points + velocity

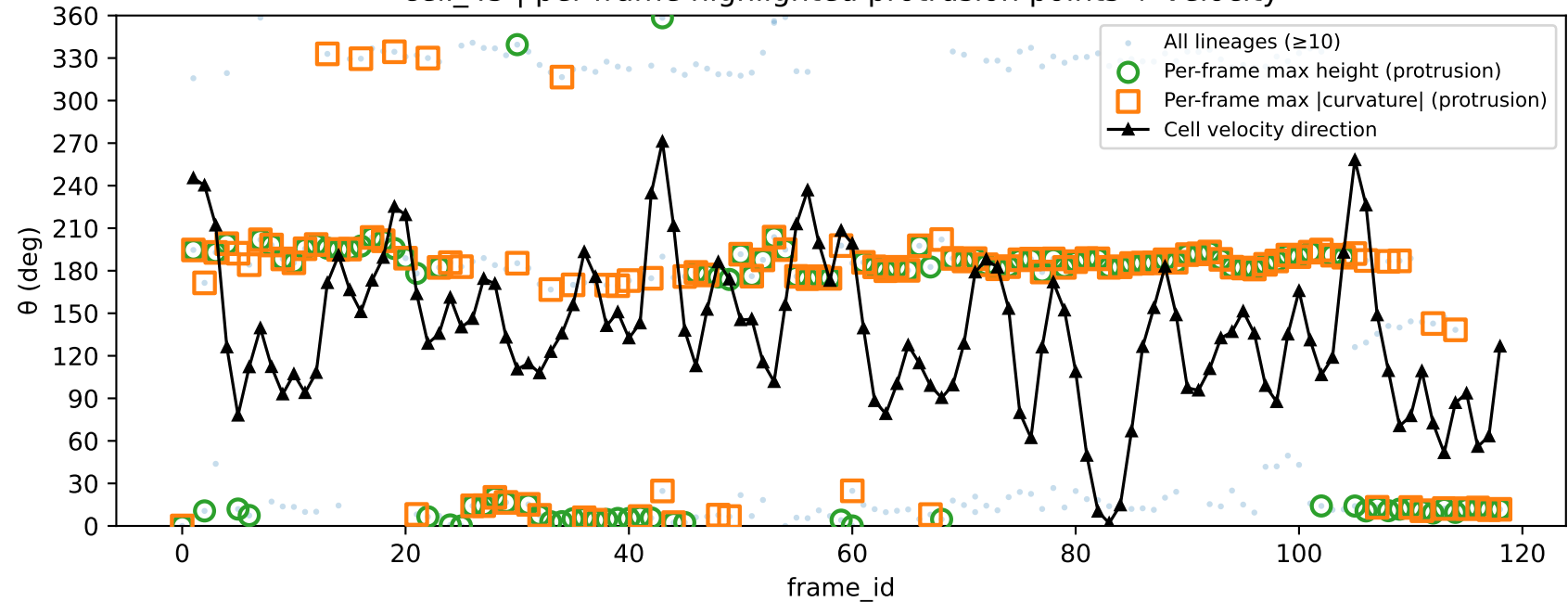cell_42 | per-frame highlighted protrusion points + velocity

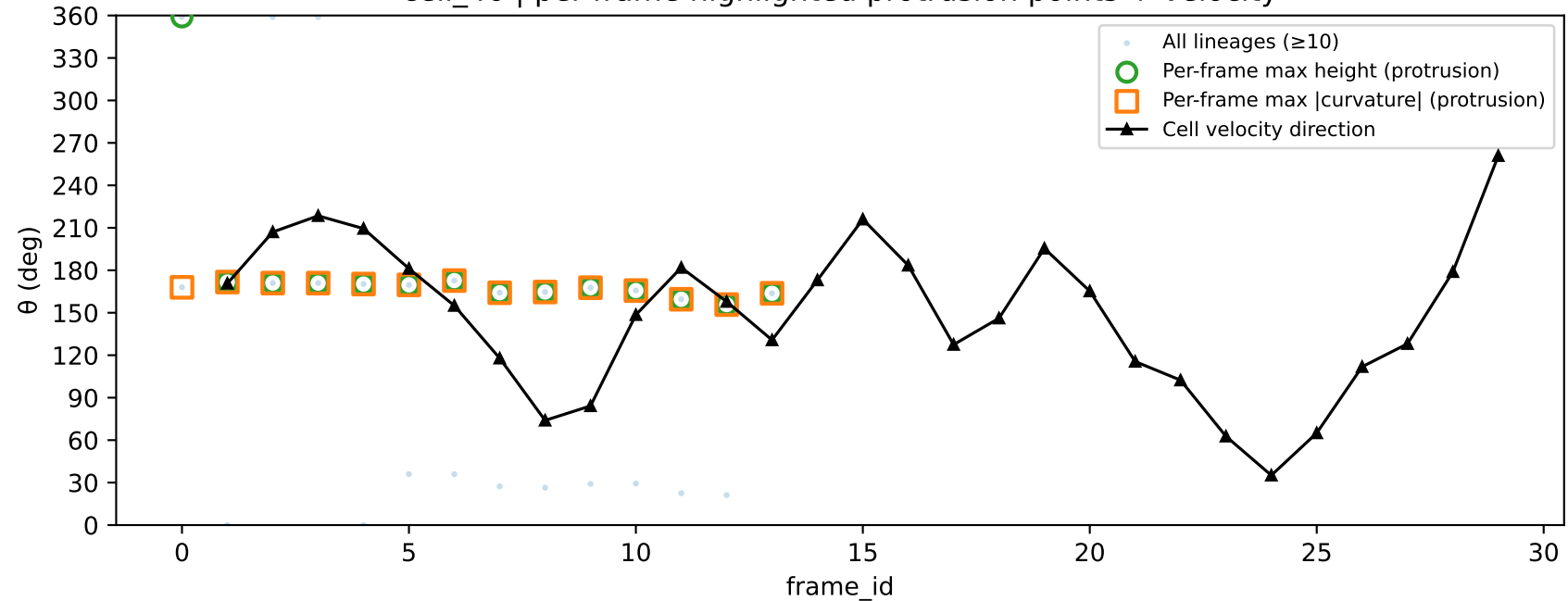cell_43 | per-frame highlighted protrusion points + velocity
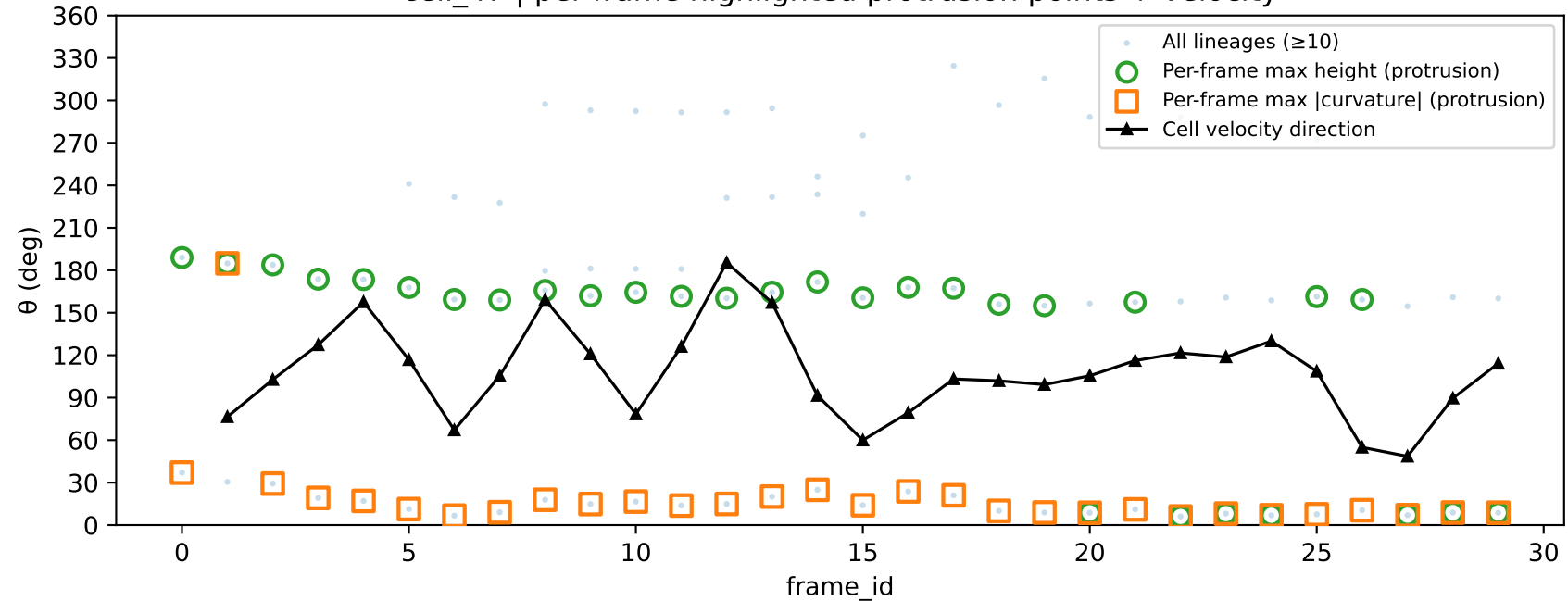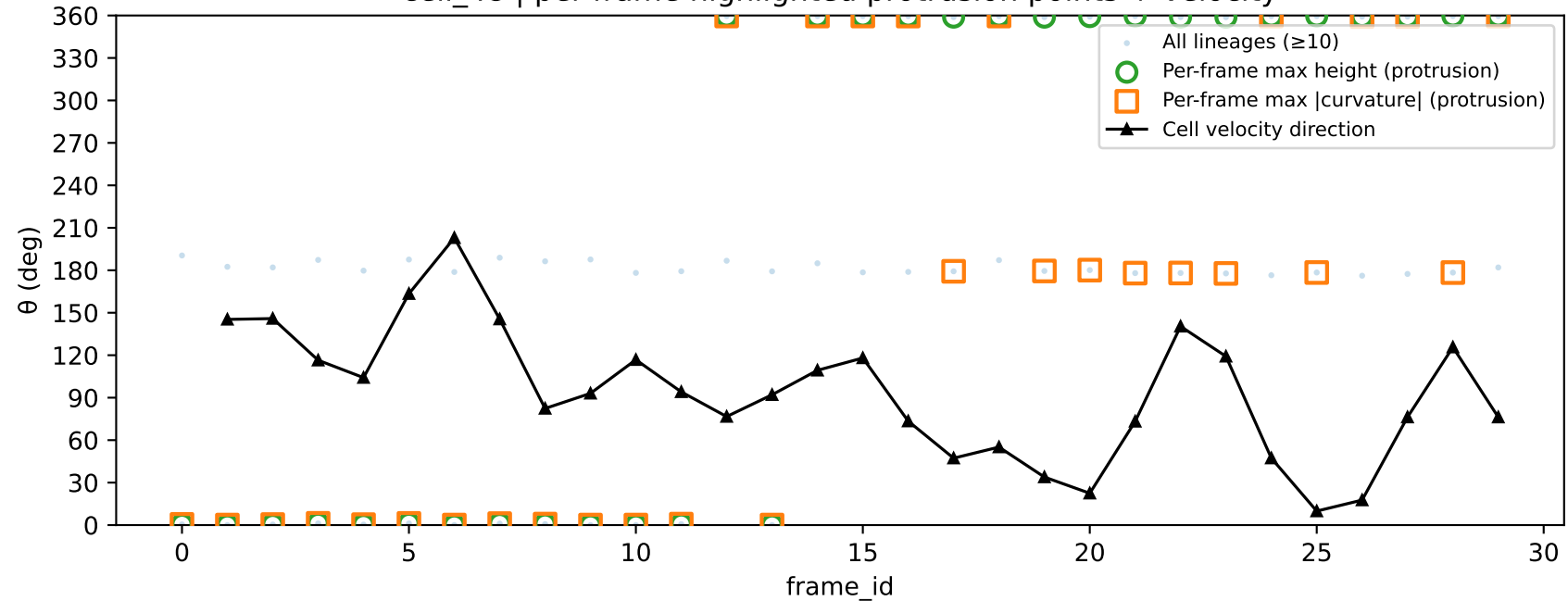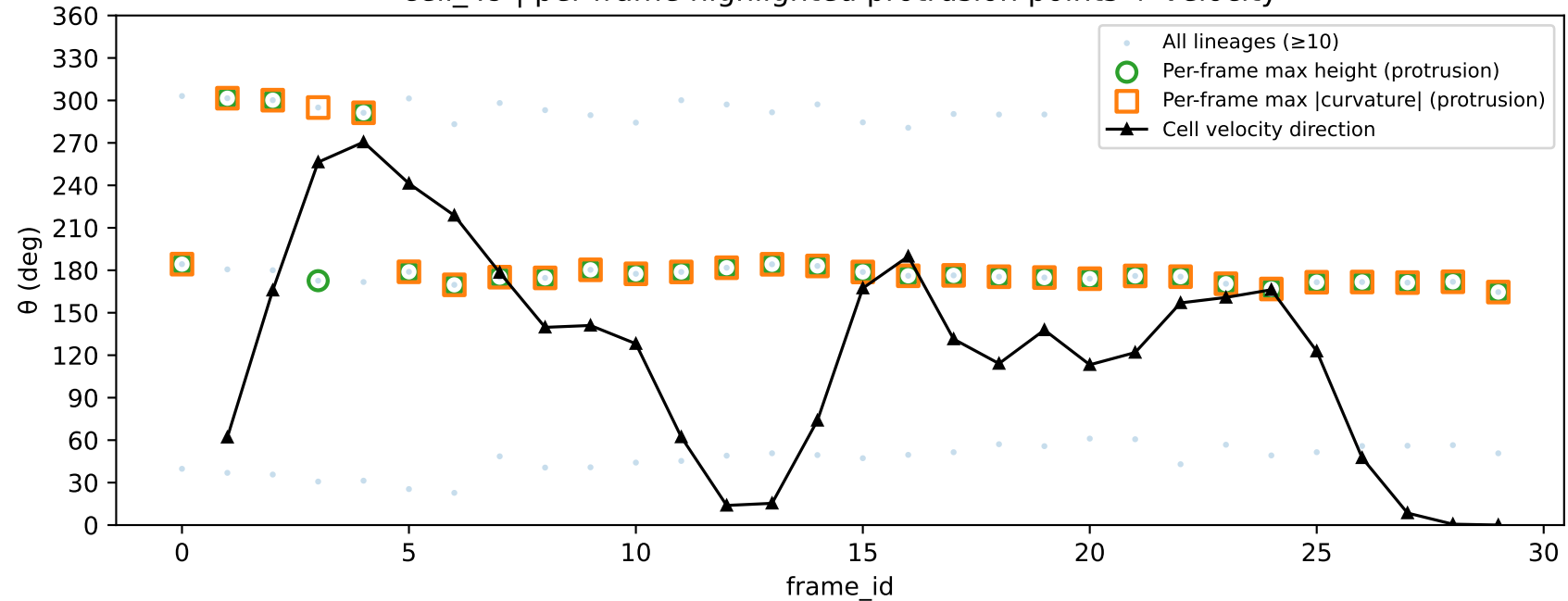
Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

x-axis: frame_id

y-axis: θ (deg)

cell_44 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

θ (deg) vs frame_id

cell_45 | per-frame highlighted protrusion points + velocity

cell_46 | per-frame highlighted protrusion points + velocity

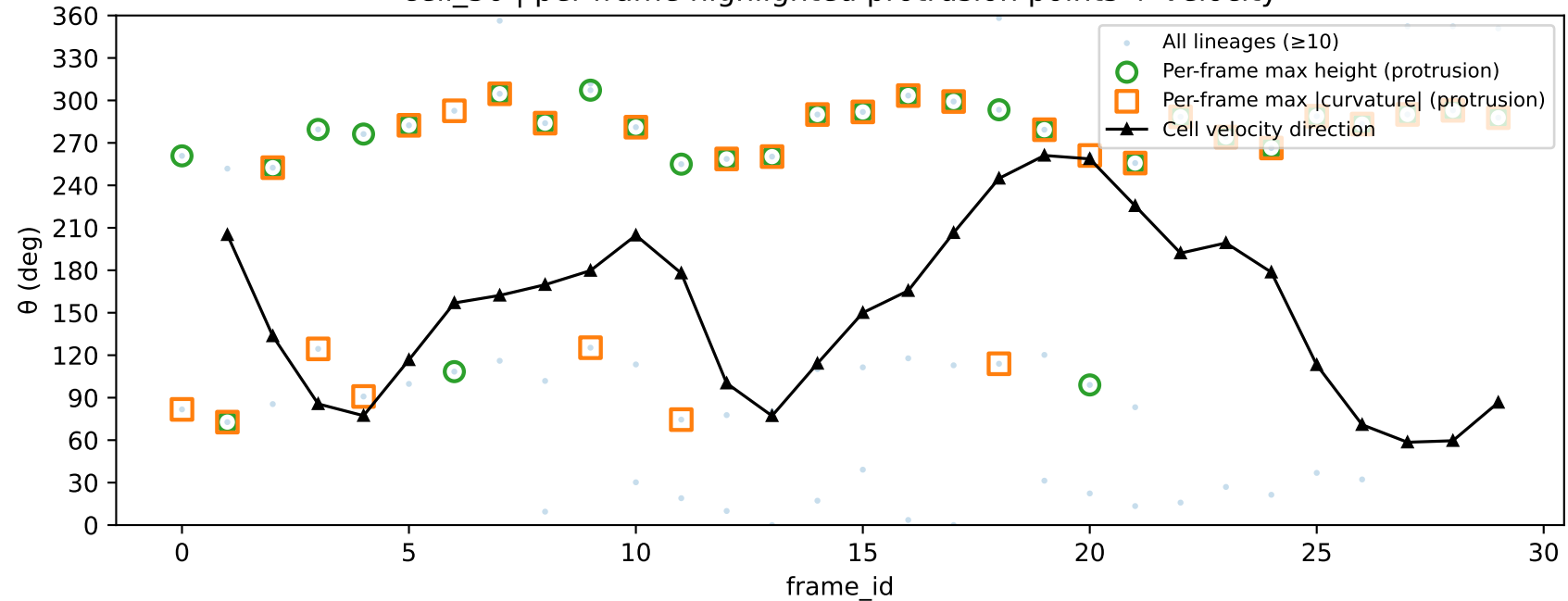cell_47 | per-frame highlighted protrusion points + velocity

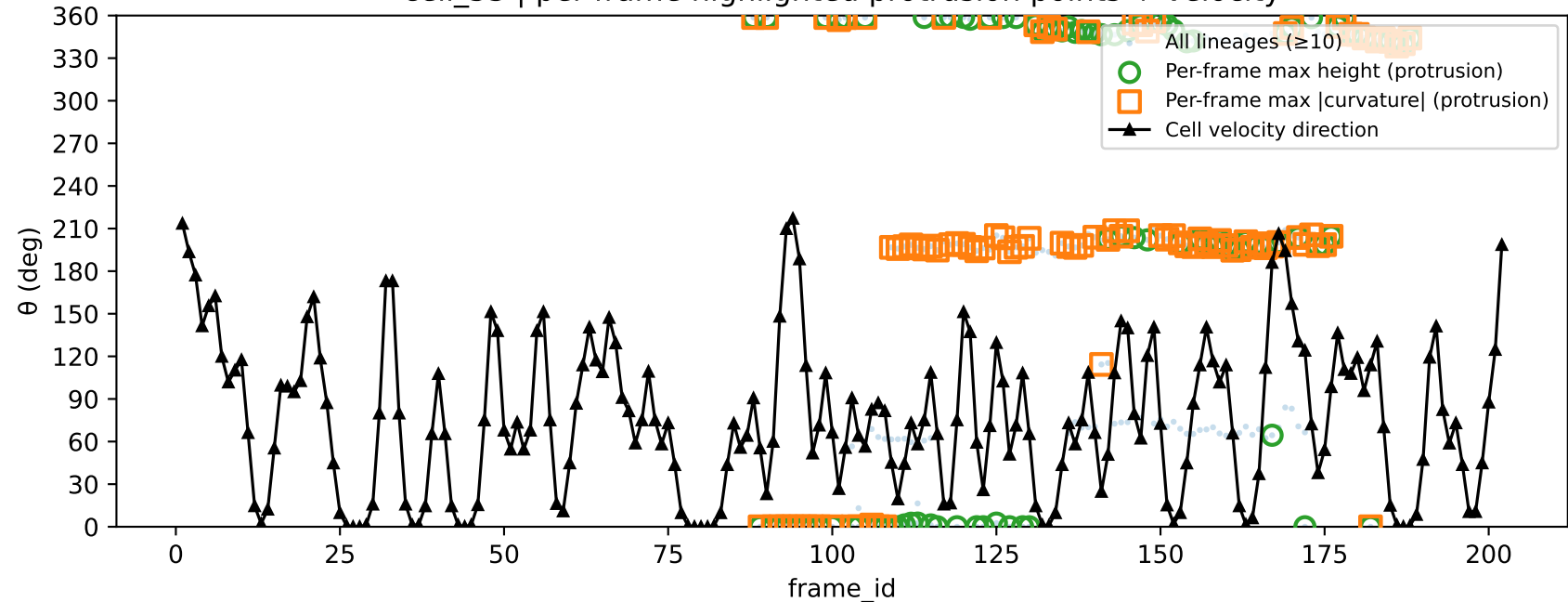cell_48 | per-frame highlighted protrusion points + velocity

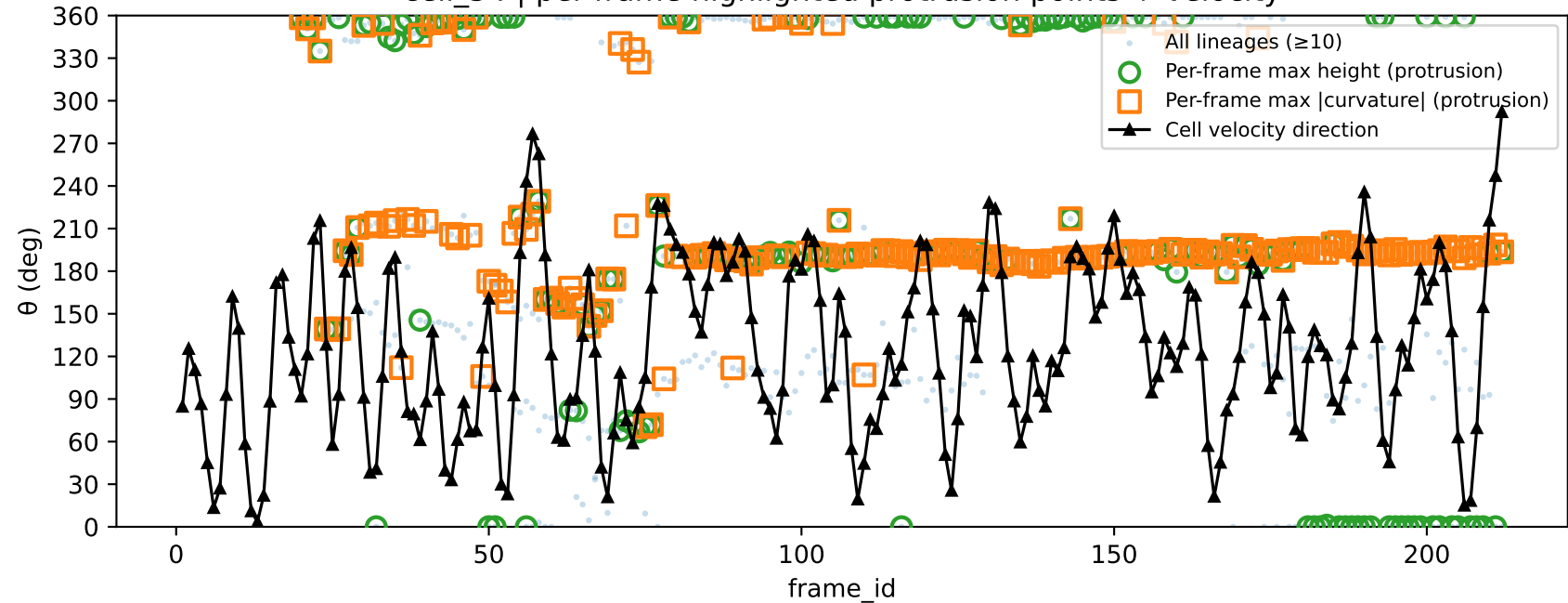cell_49 | per-frame highlighted protrusion points + velocity

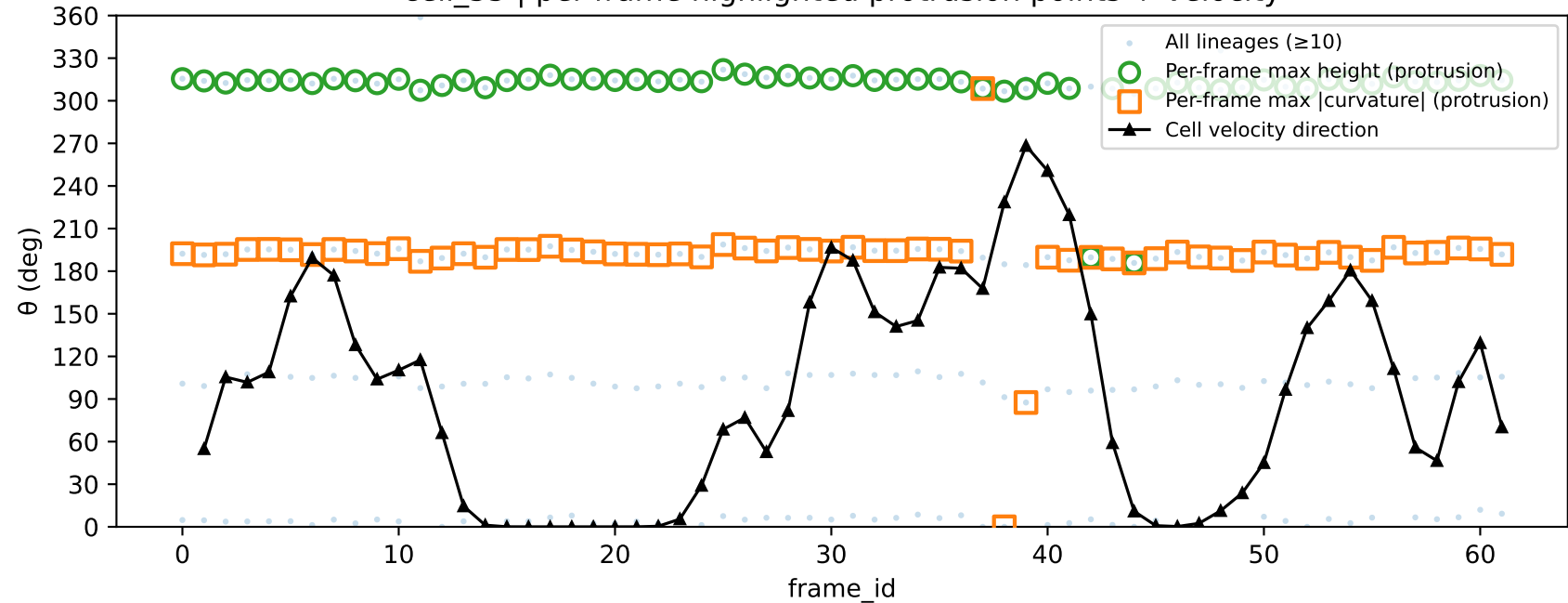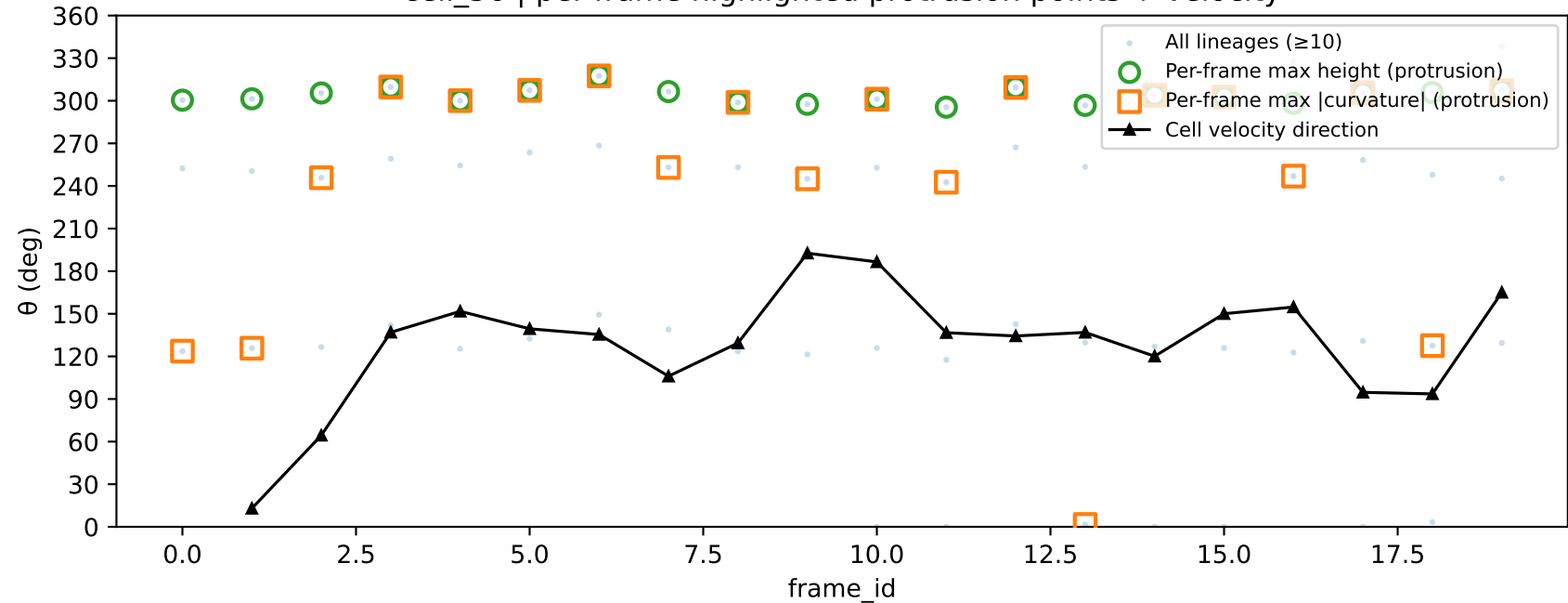cell_50 | per-frame highlighted protrusion points + velocity
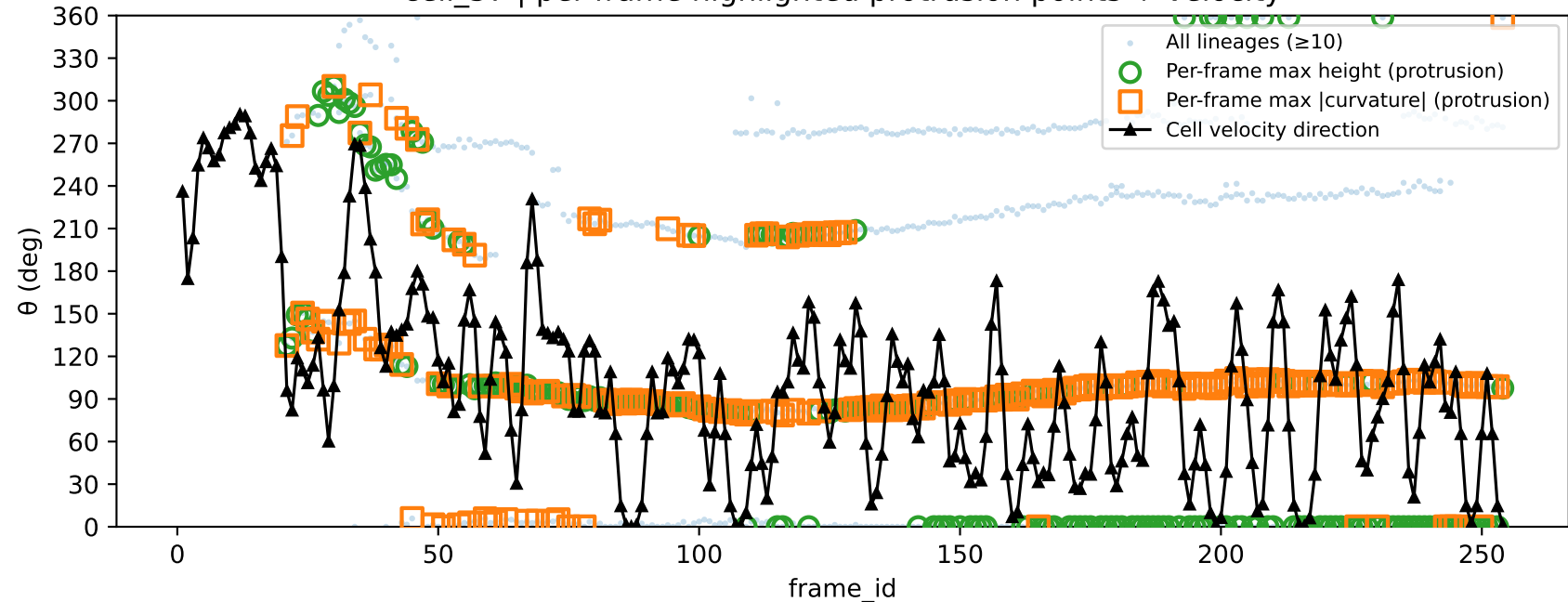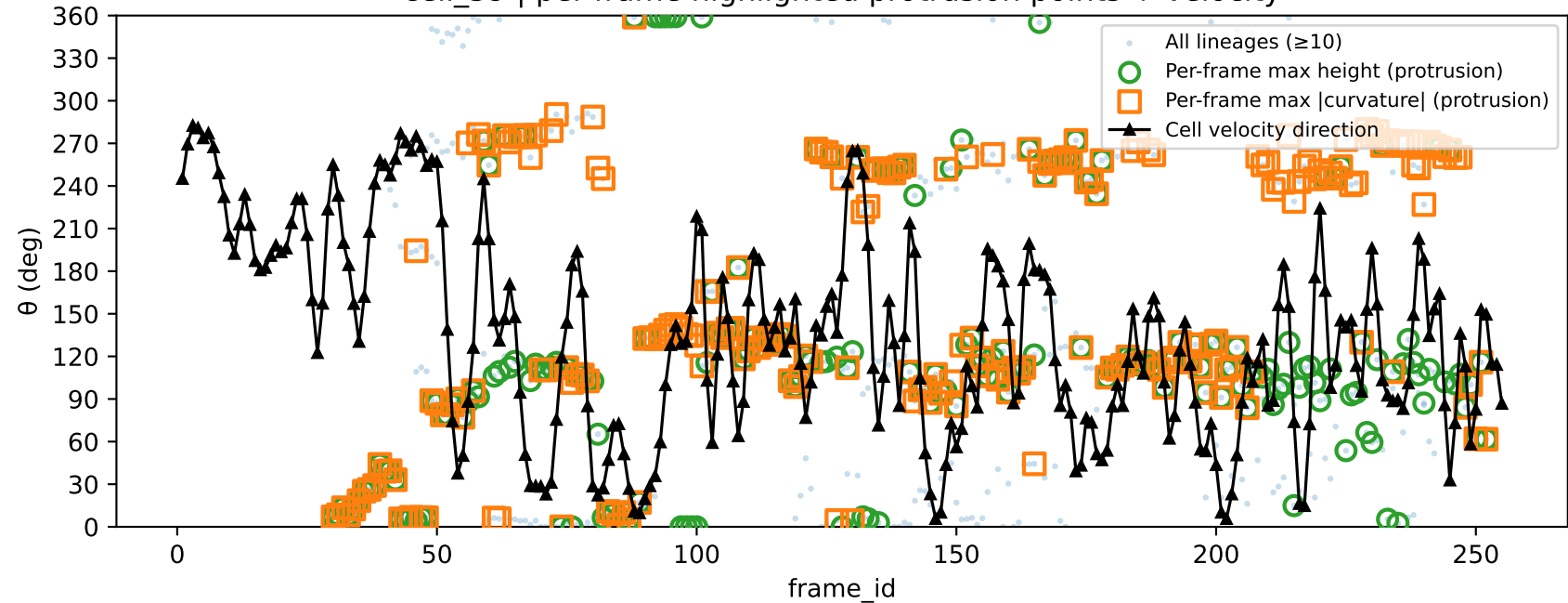
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

cell_53 | per-frame highlighted protrusion points + velocity

cell_54 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

θ (deg)

frame_id

cell_55 | per-frame highlighted protrusion points + velocity

cell_56 | per-frame highlighted protrusion points + velocity

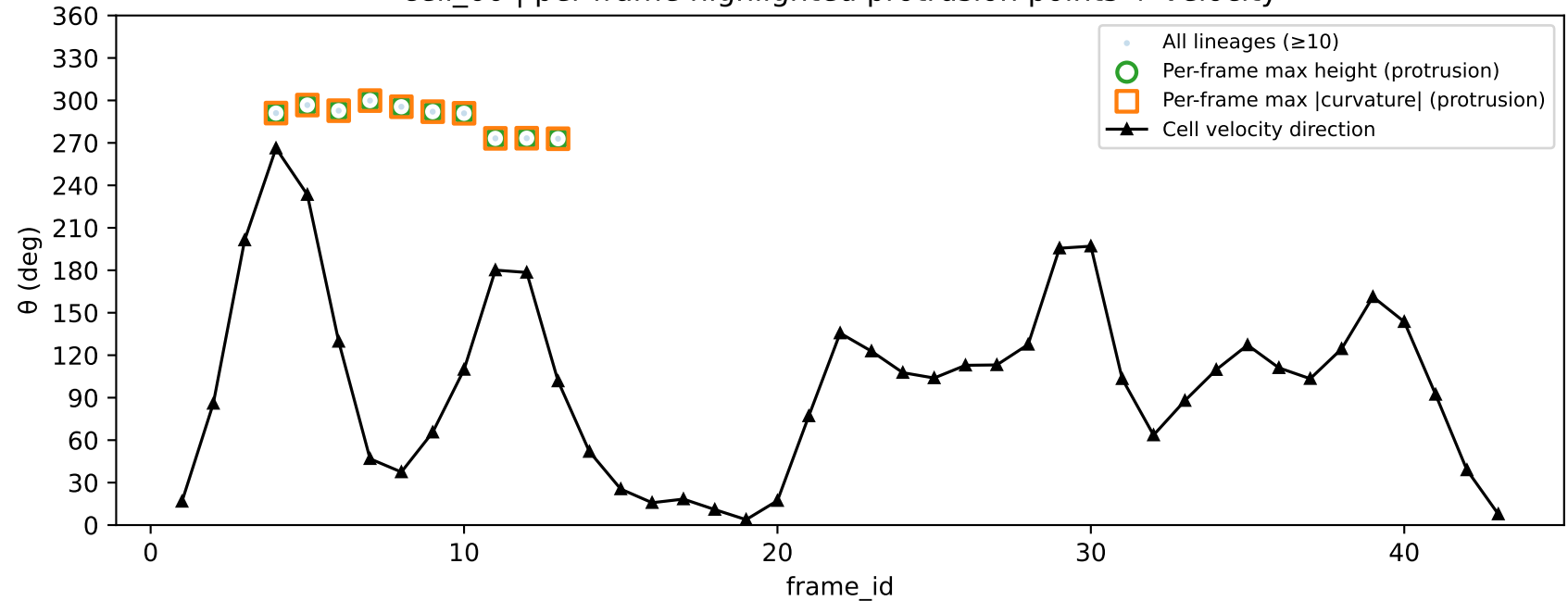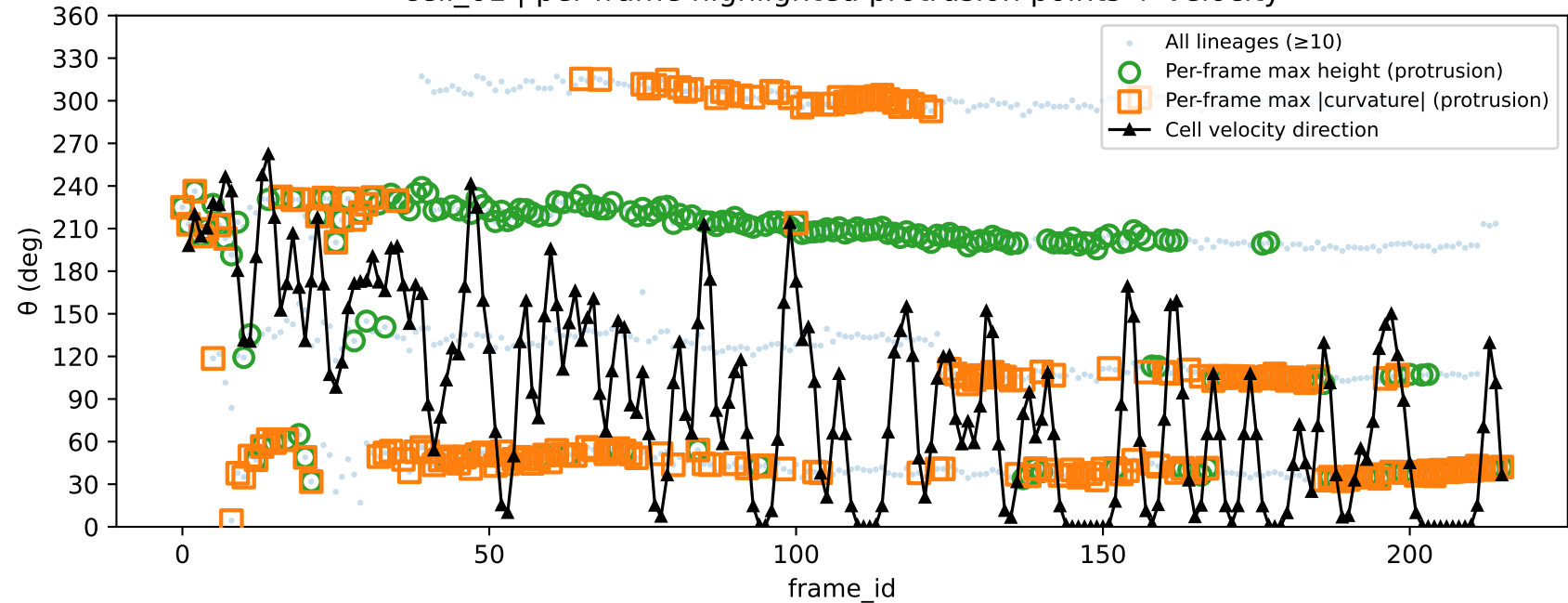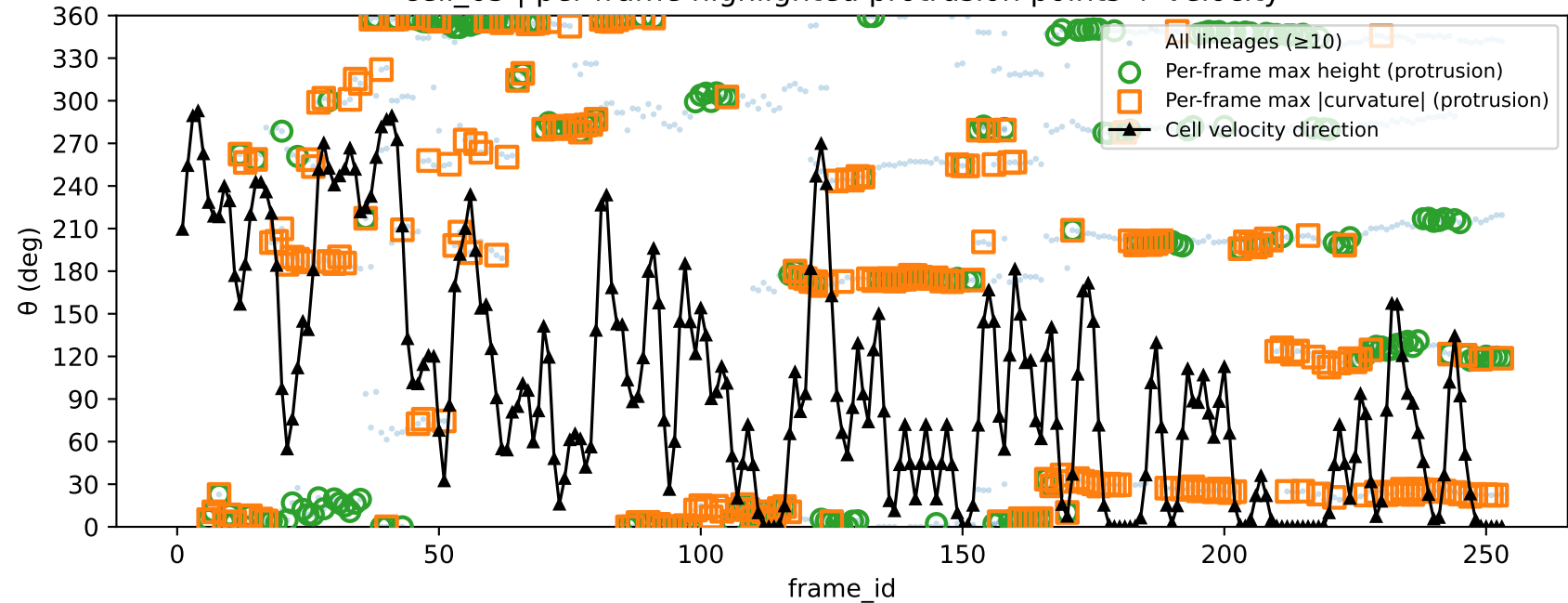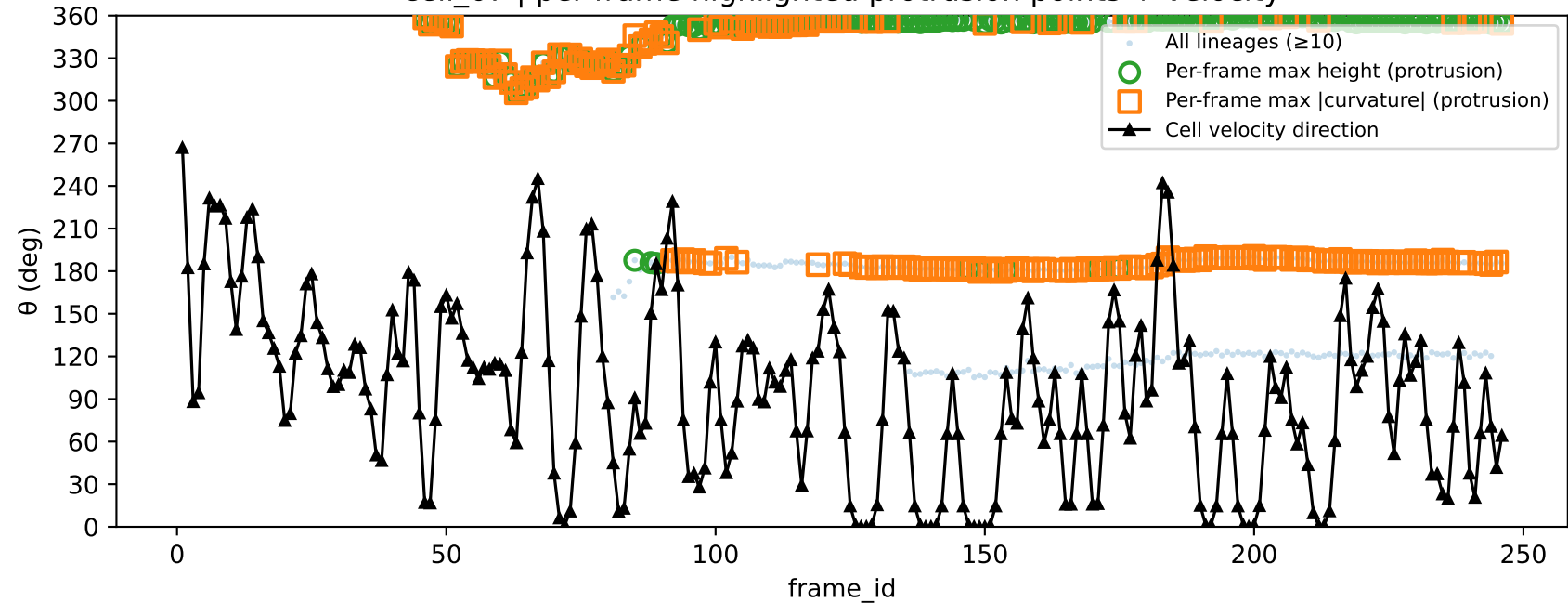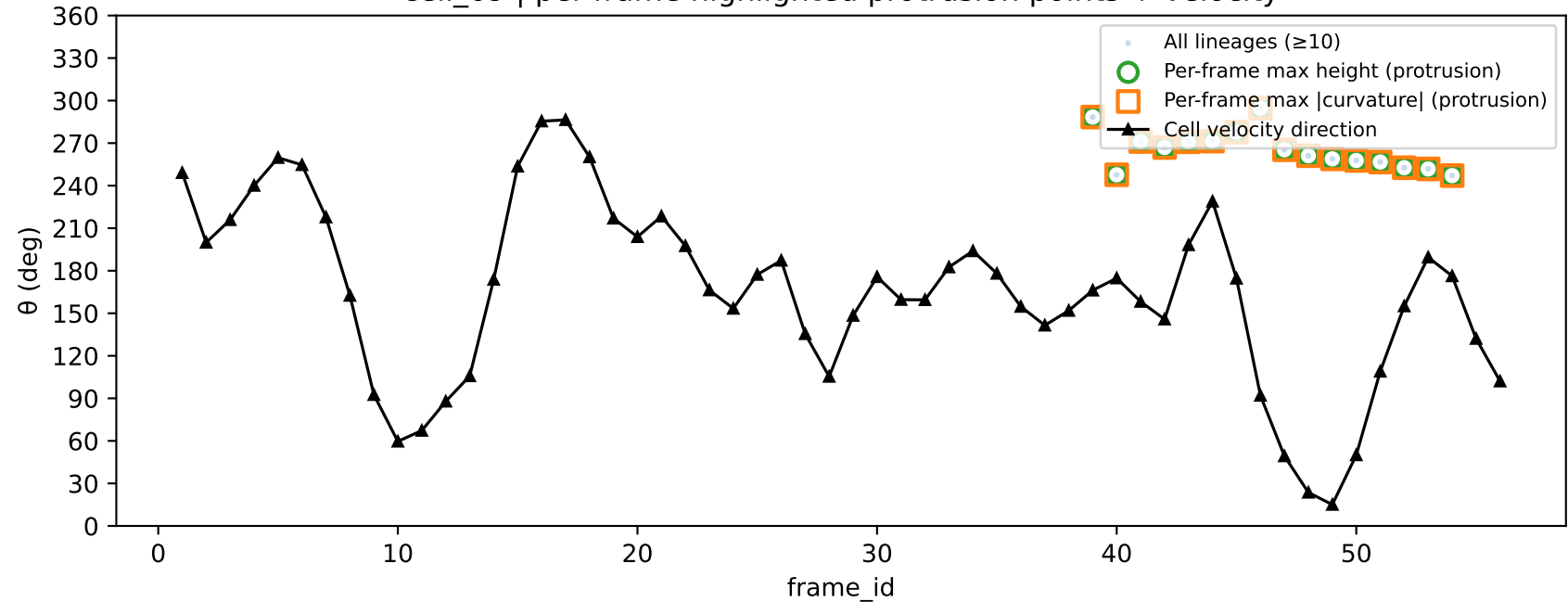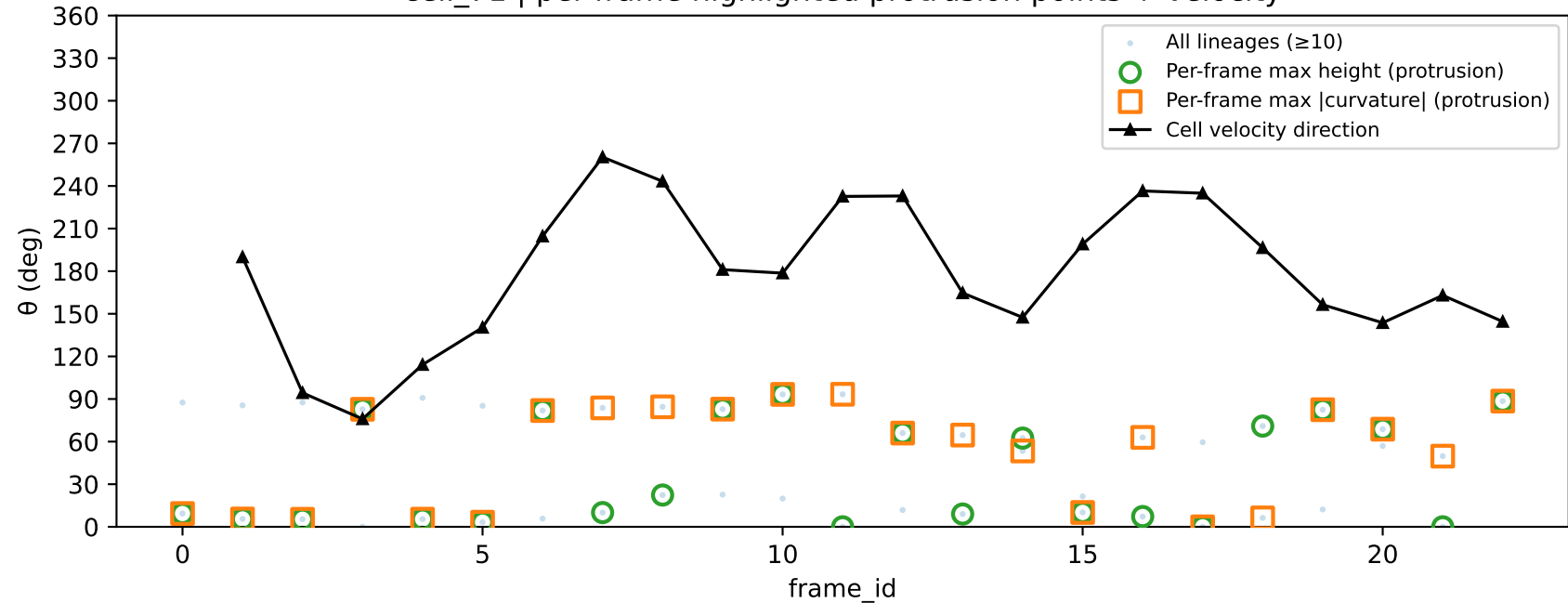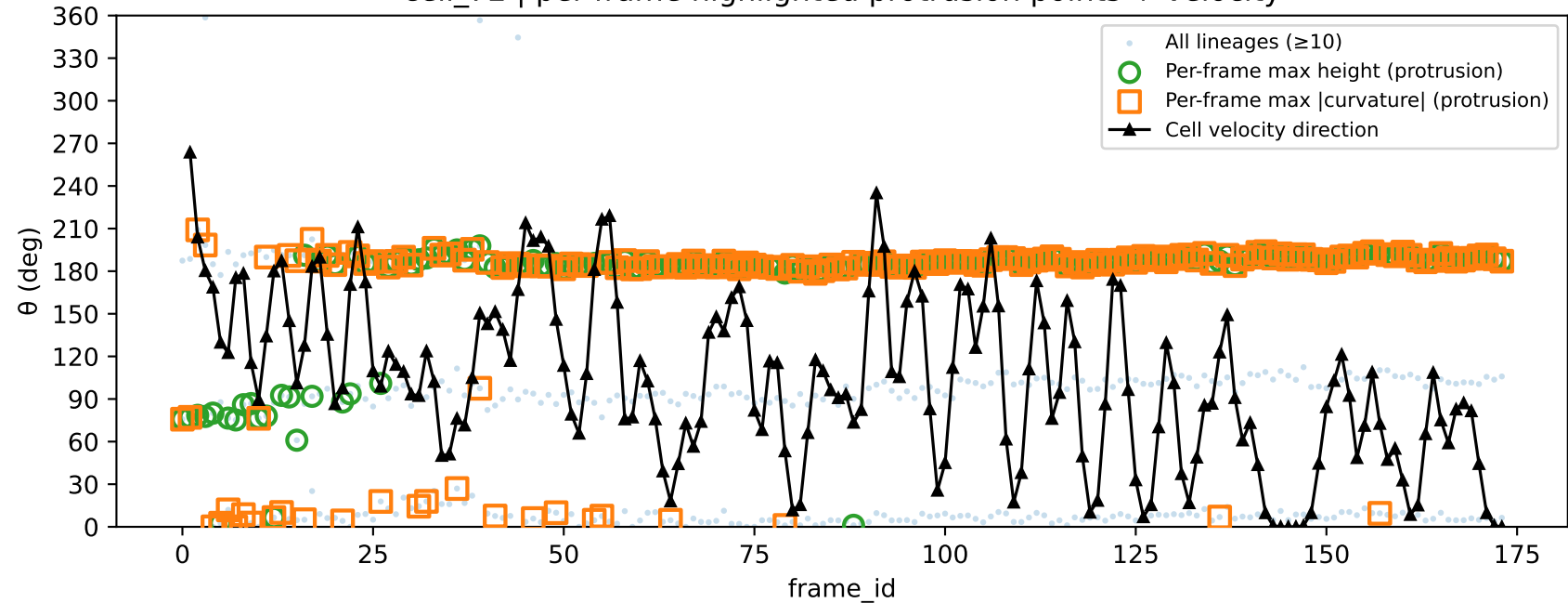cell_57 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

x-axis: frame_id
y-axis: θ (deg)

cell_59 | per-frame highlighted protrusion points + velocity

- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

cell_60 | per-frame highlighted protrusion points + velocity

cell_61 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
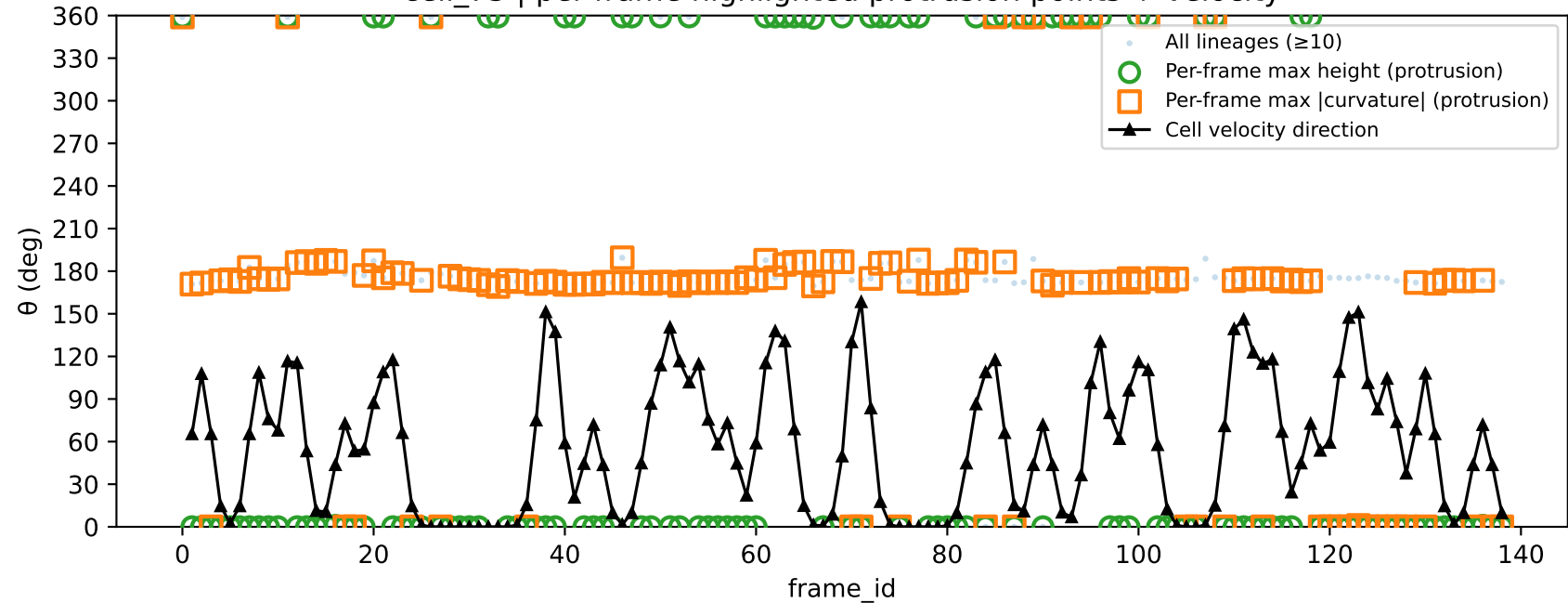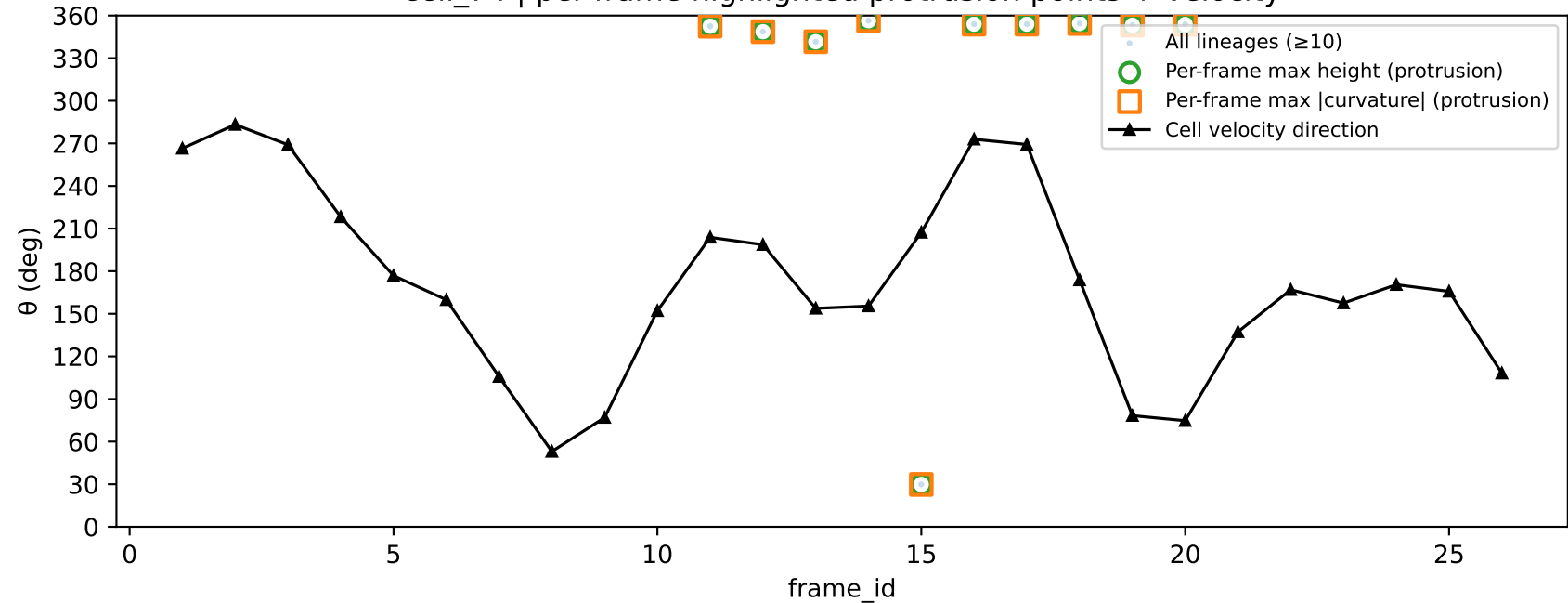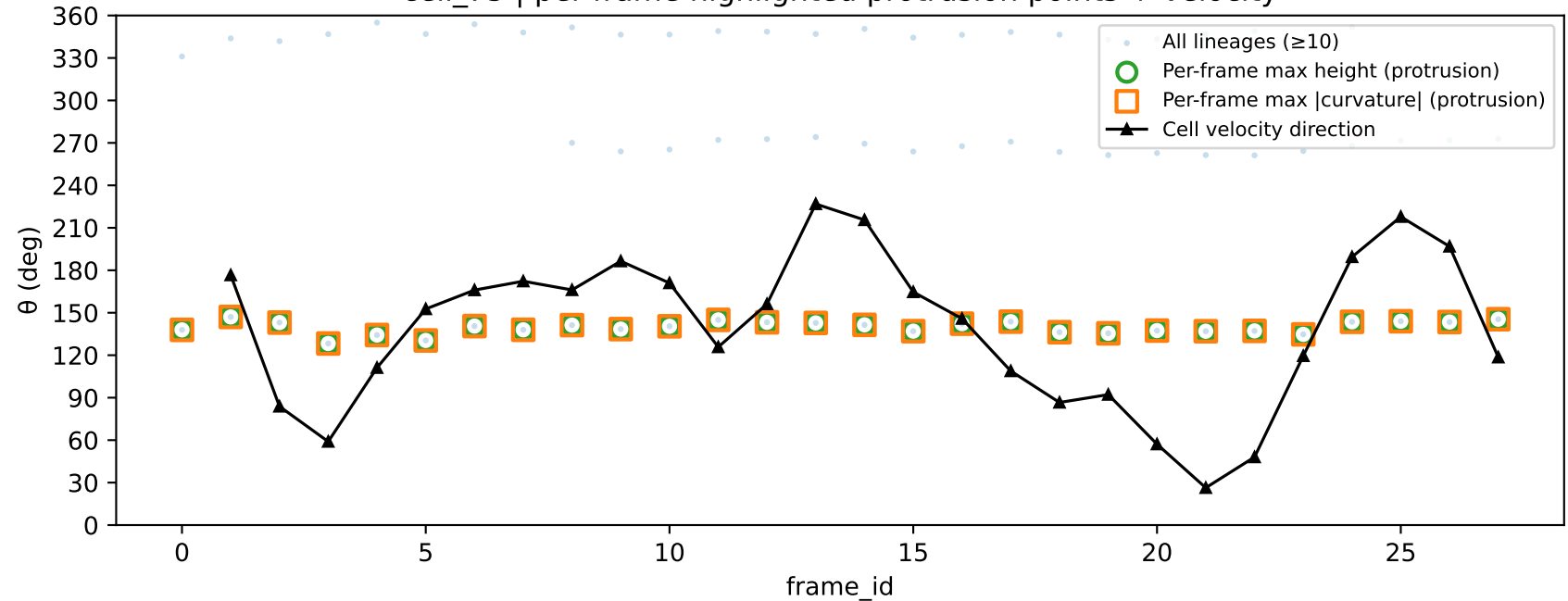- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

x-axis: frame_id
y-axis: θ (deg)

cell_65 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

x-axis: frame_id
y-axis: θ (deg)

cell_67 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

x-axis: frame_id

y-axis: θ (deg)

cell_69 | per-frame highlighted protrusion points + velocity

cell_71 | per-frame highlighted protrusion points + velocity

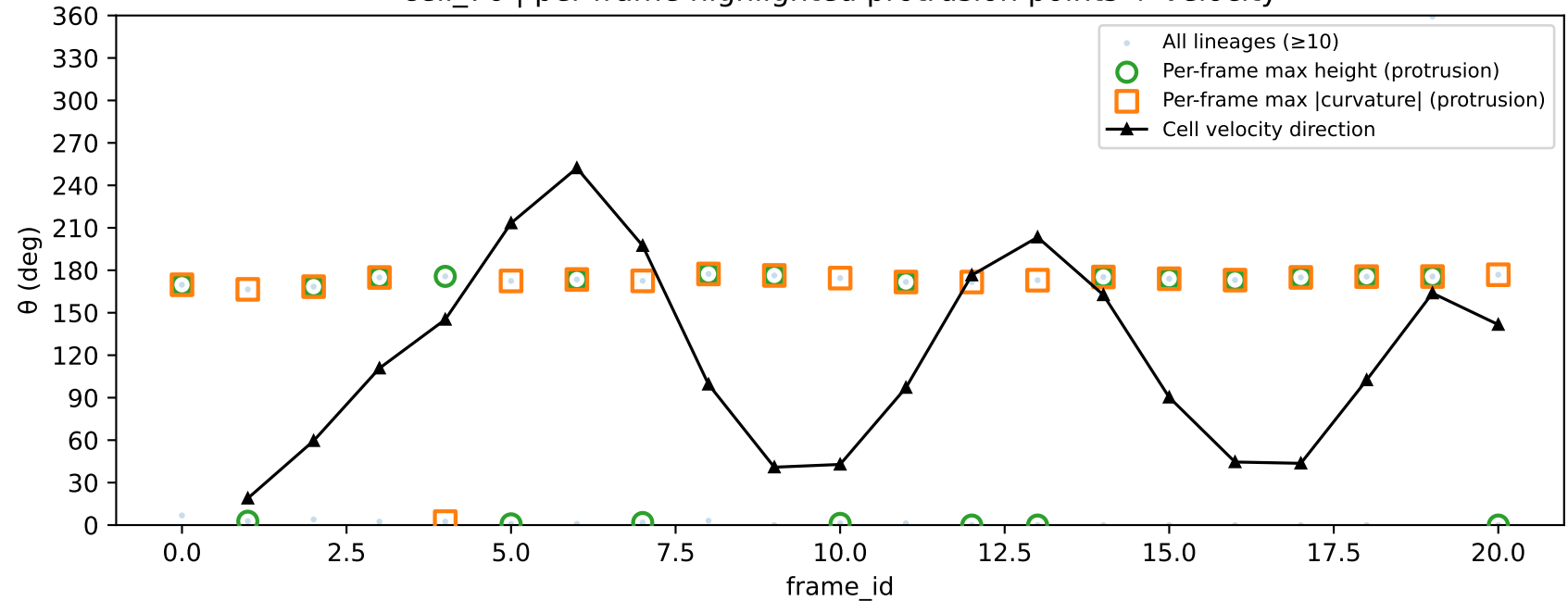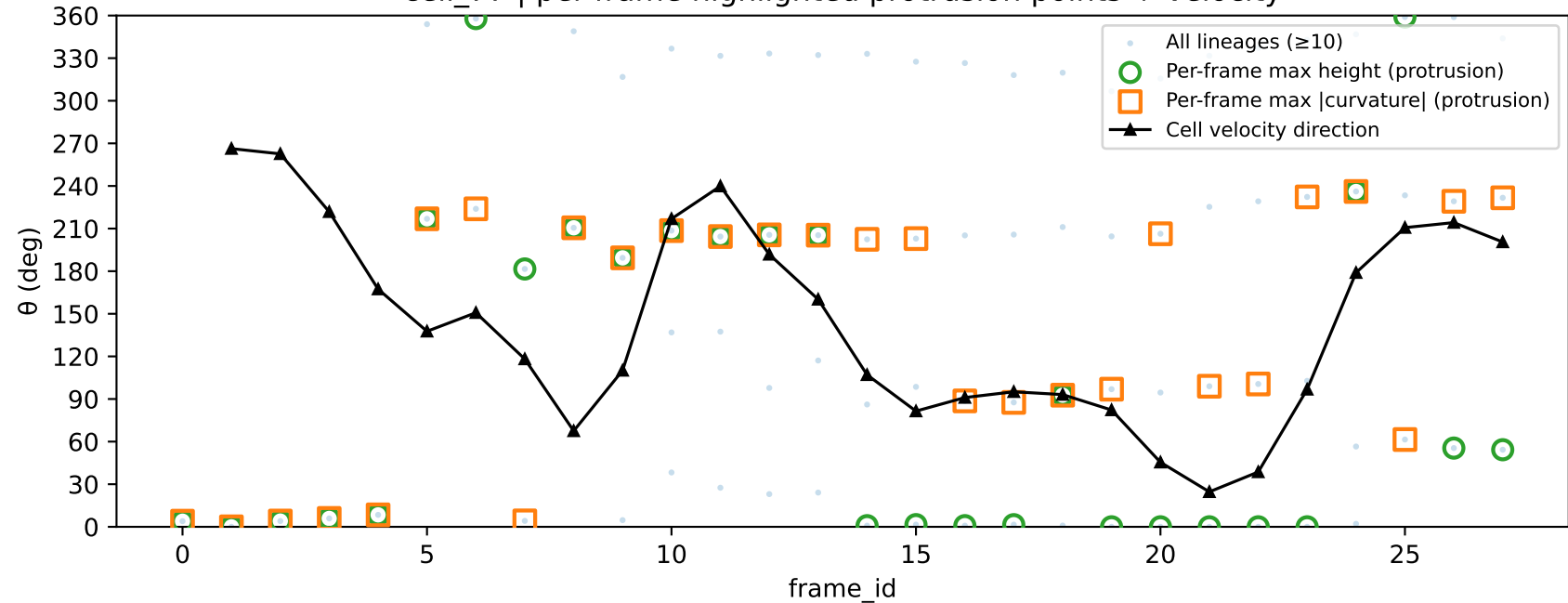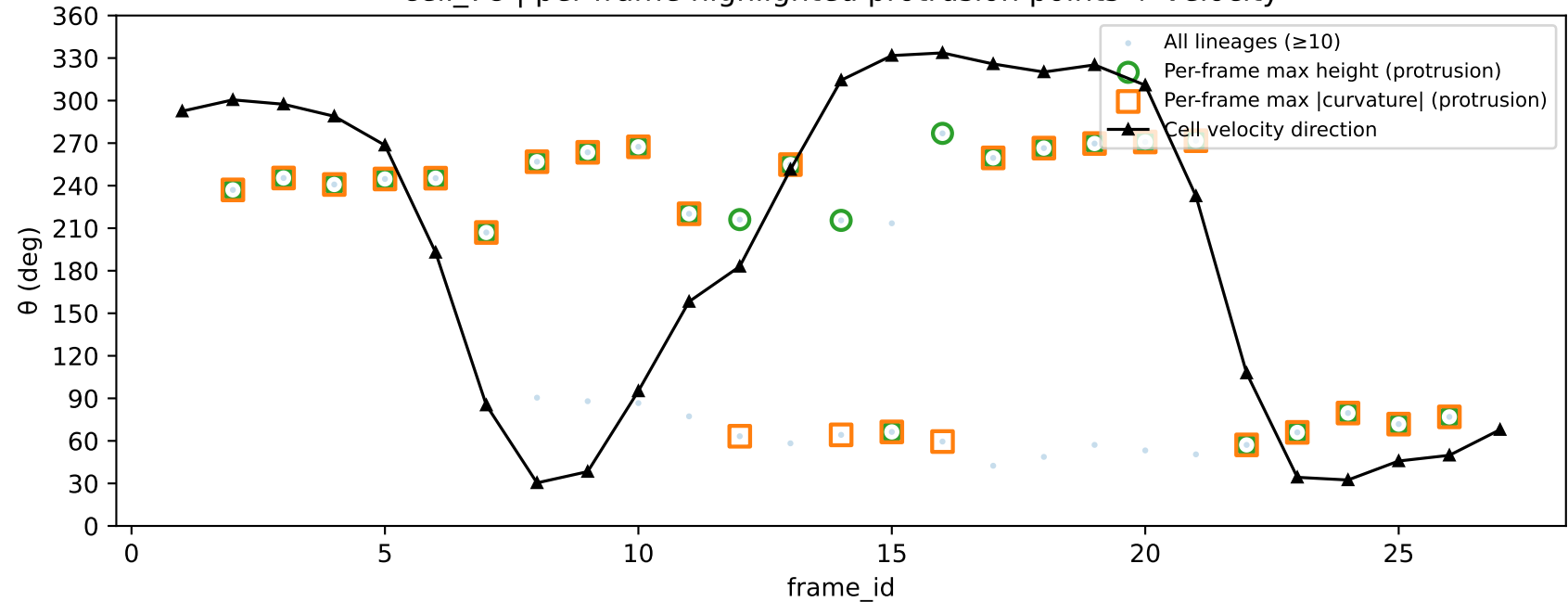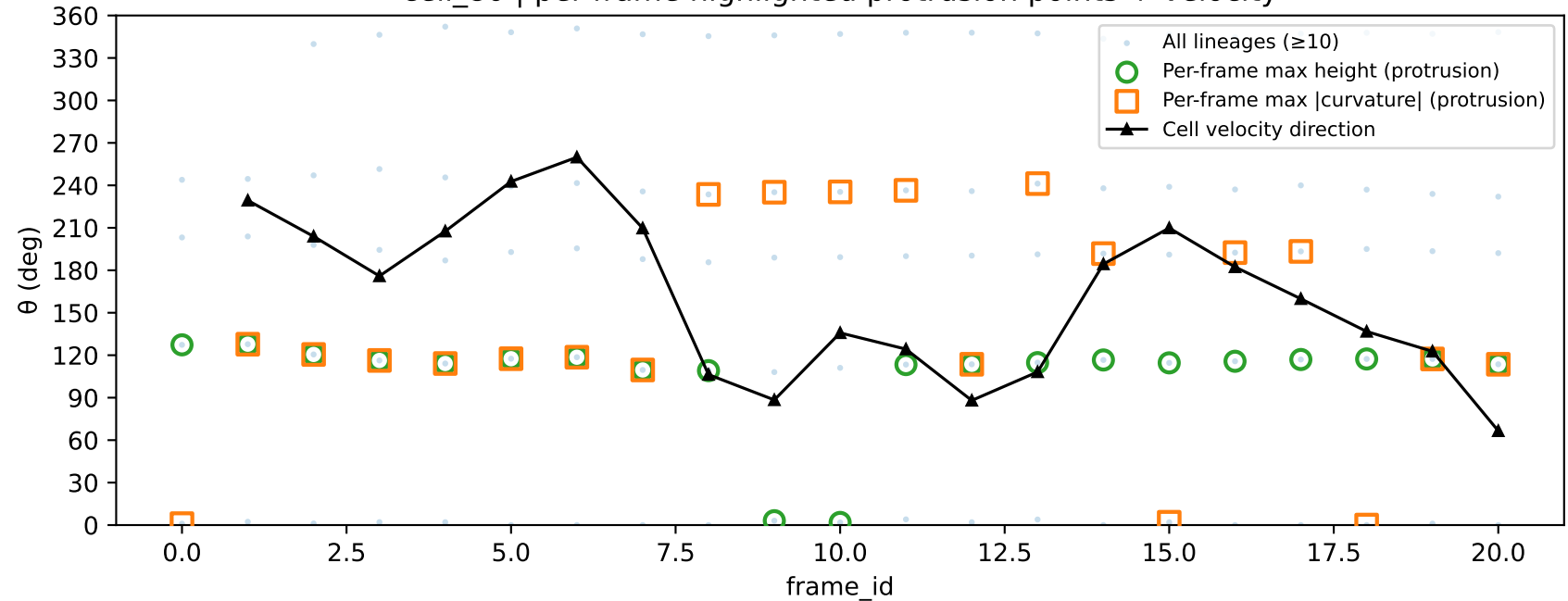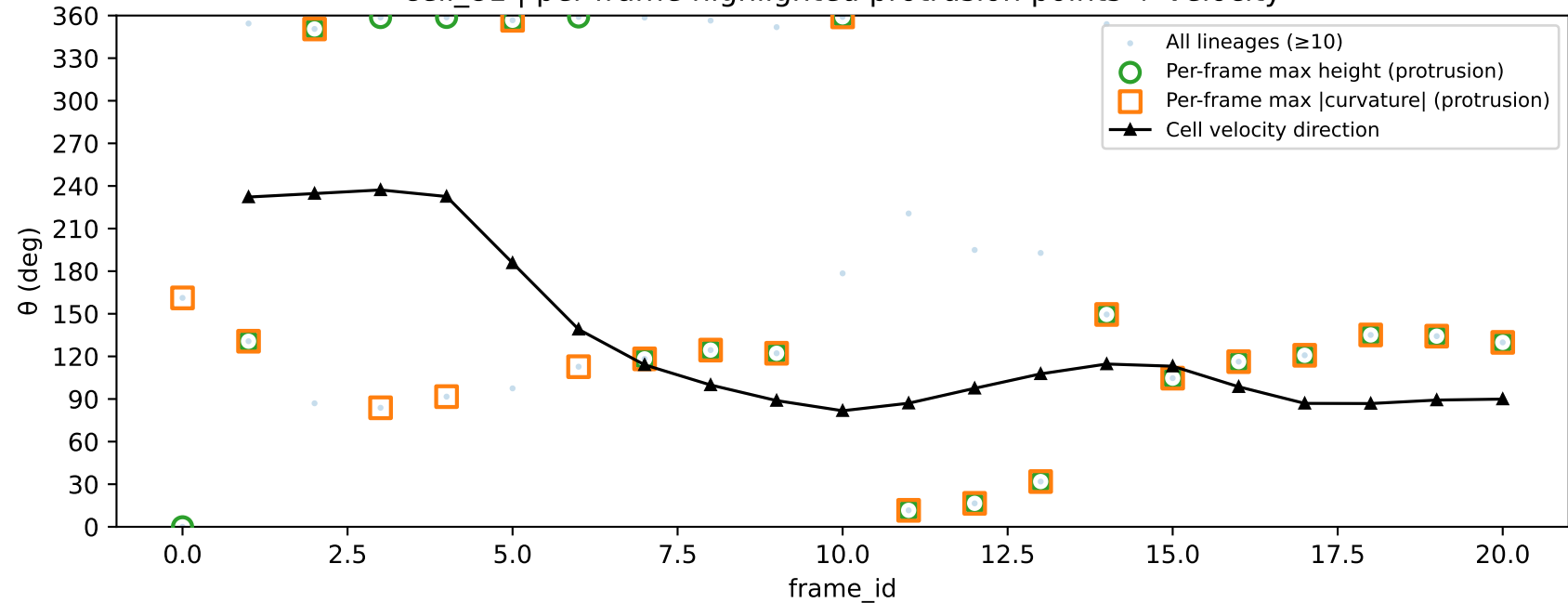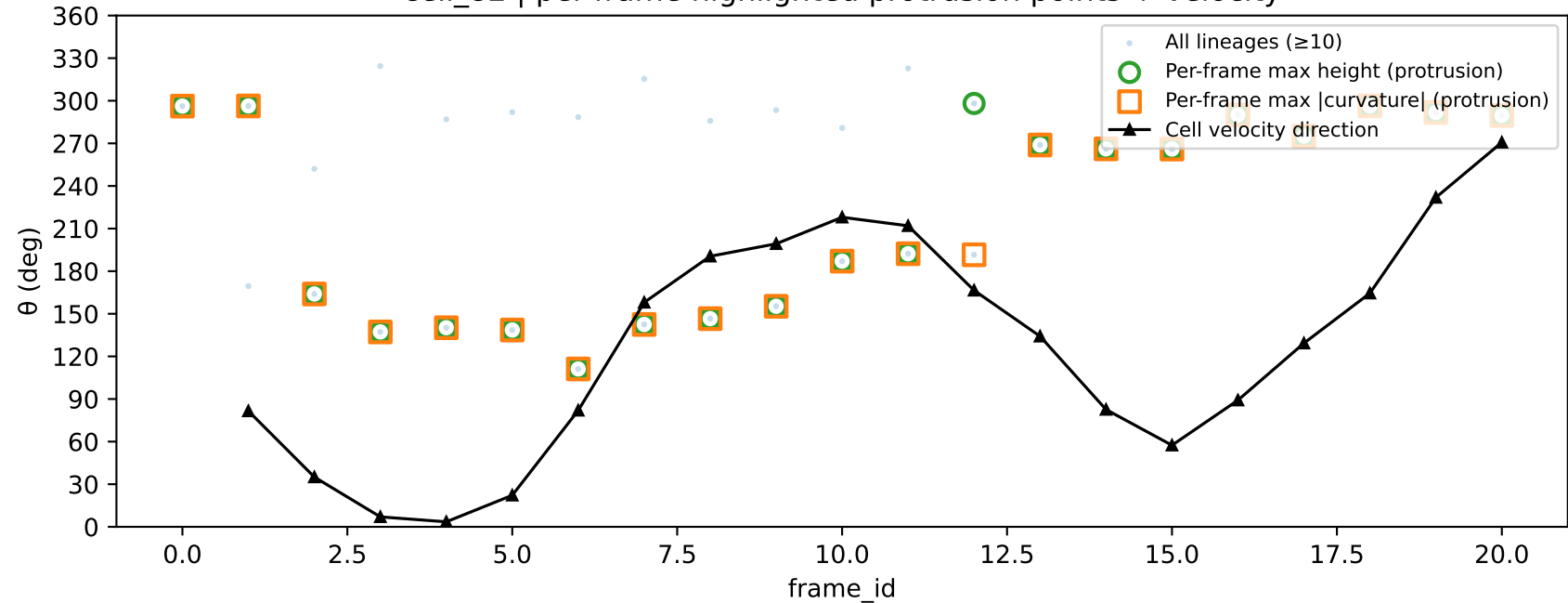cell_72 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

x-axis: frame_id

y-axis: θ (deg)

cell_73 | per-frame highlighted protrusion points + velocity

cell_74 | per-frame highlighted protrusion points + velocity

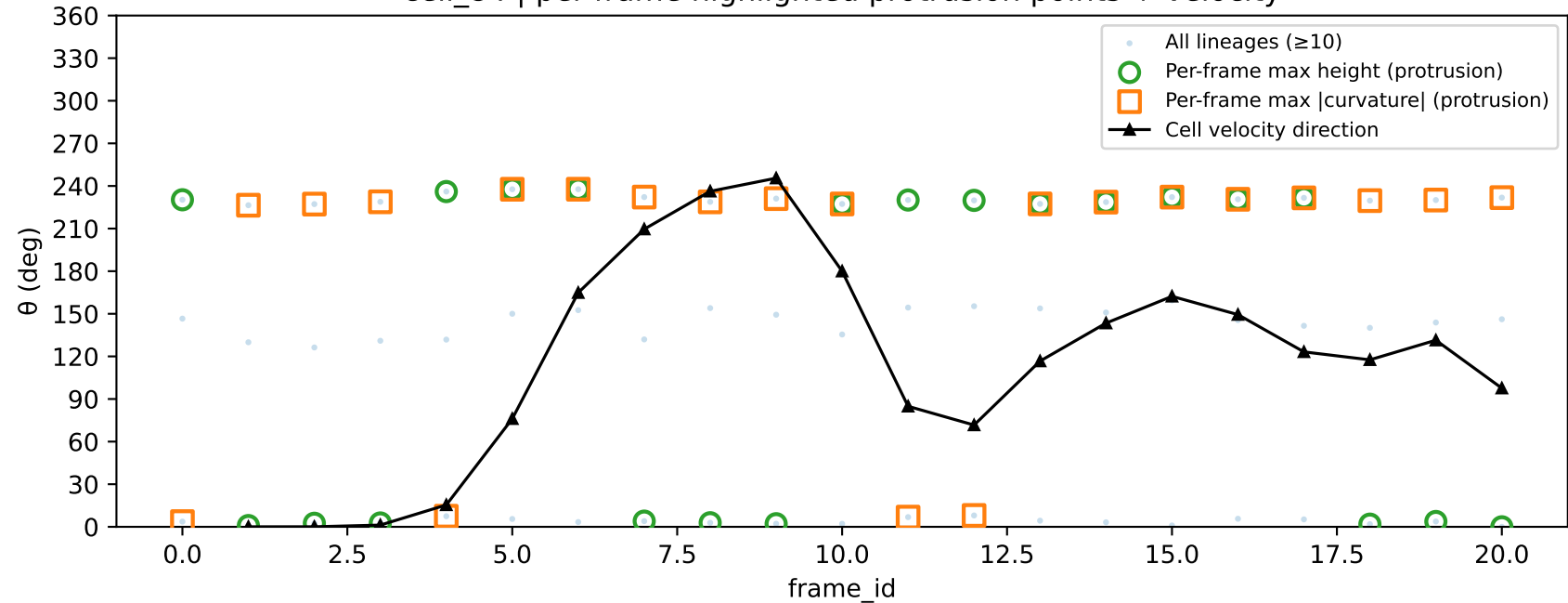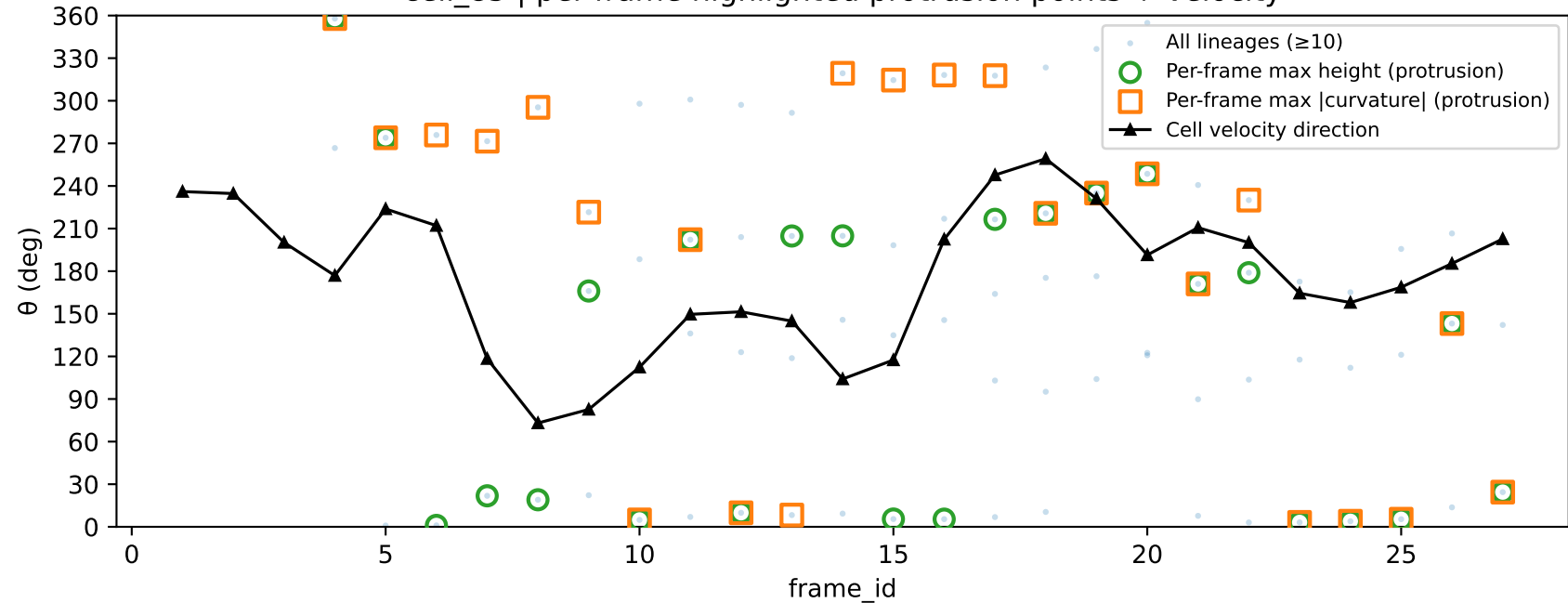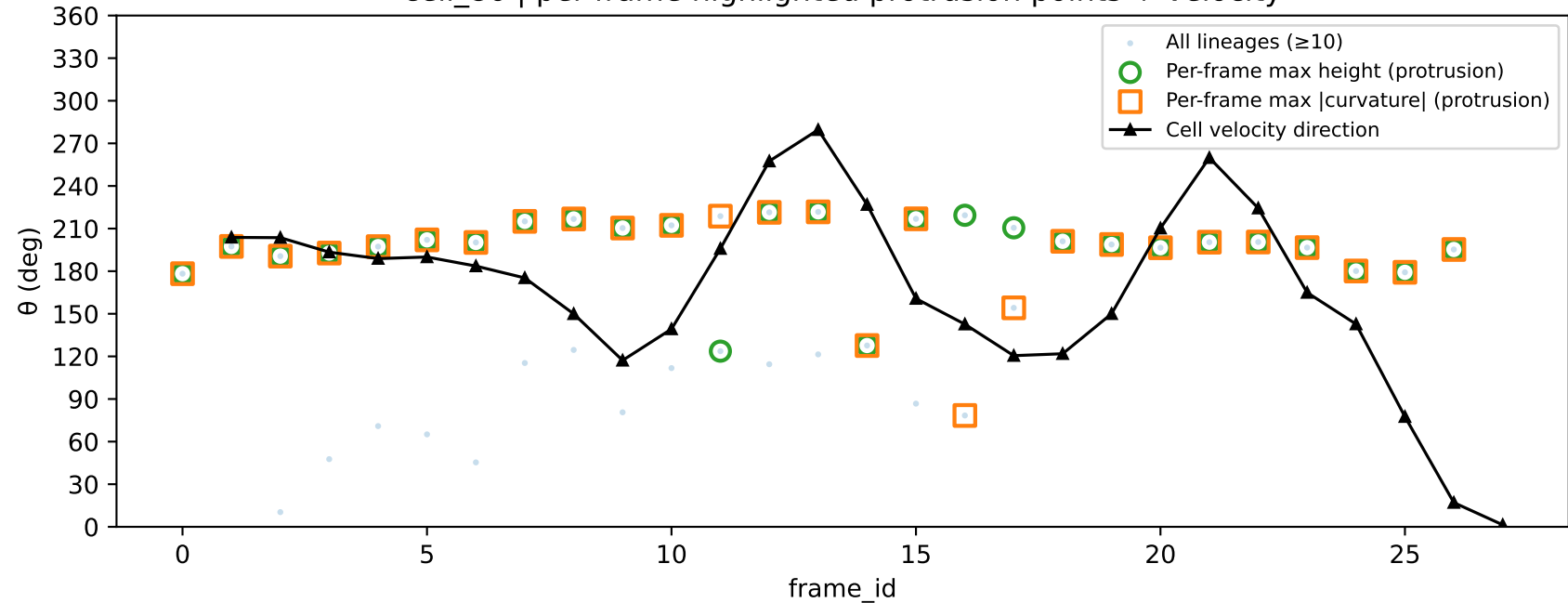cell_75 | per-frame highlighted protrusion points + velocity

cell_76 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

x-axis: frame_id
y-axis: θ (deg)

cell_77 | per-frame highlighted protrusion points + velocity

cell_78 | per-frame highlighted protrusion points + velocity

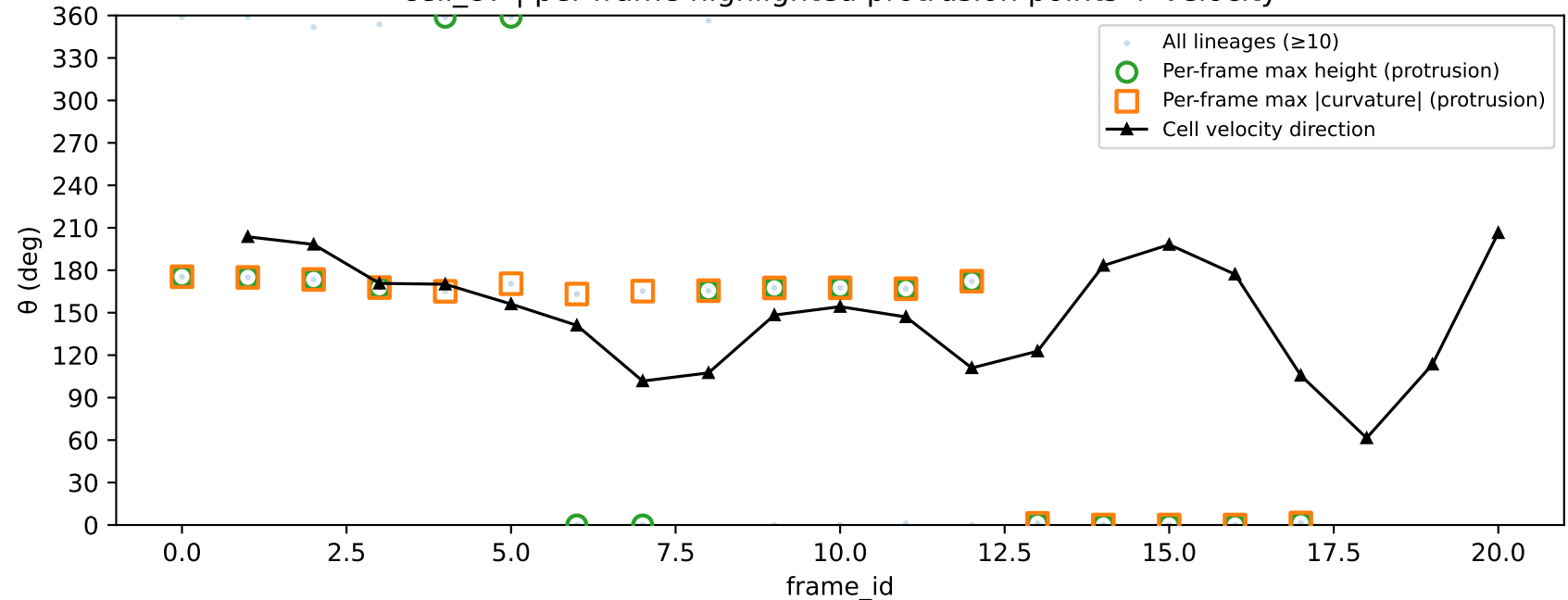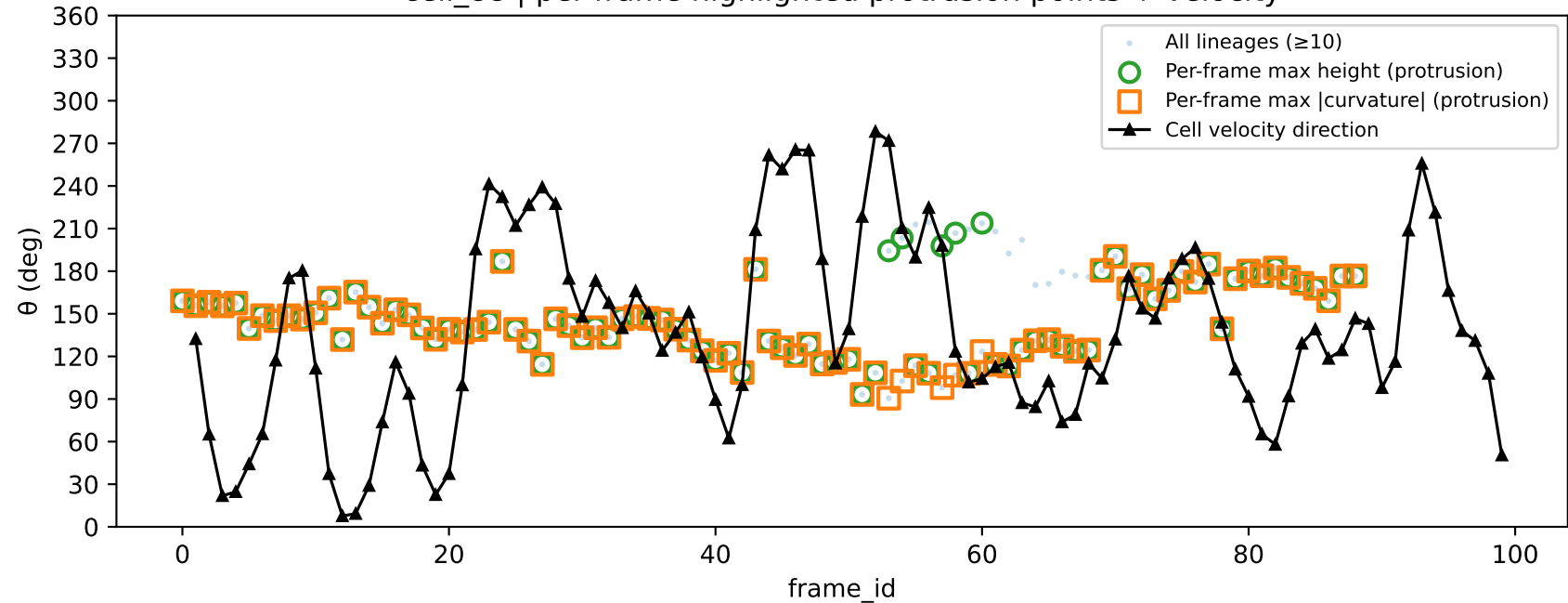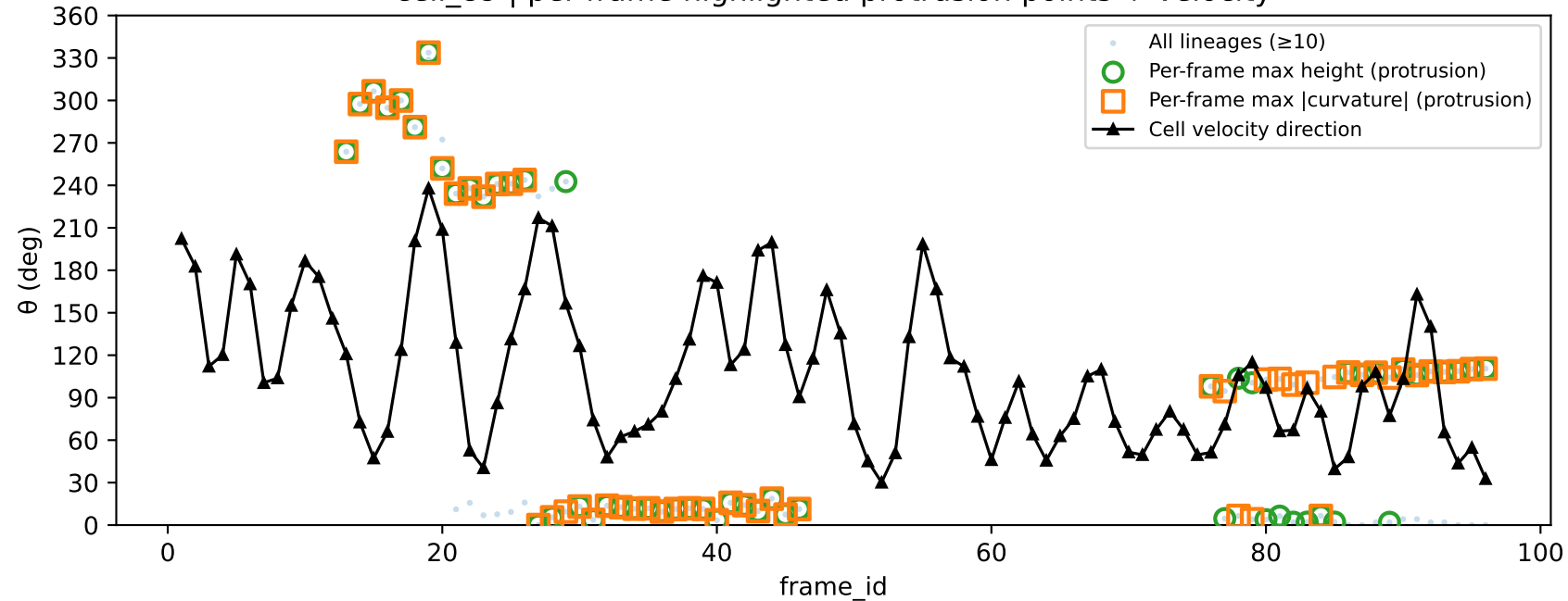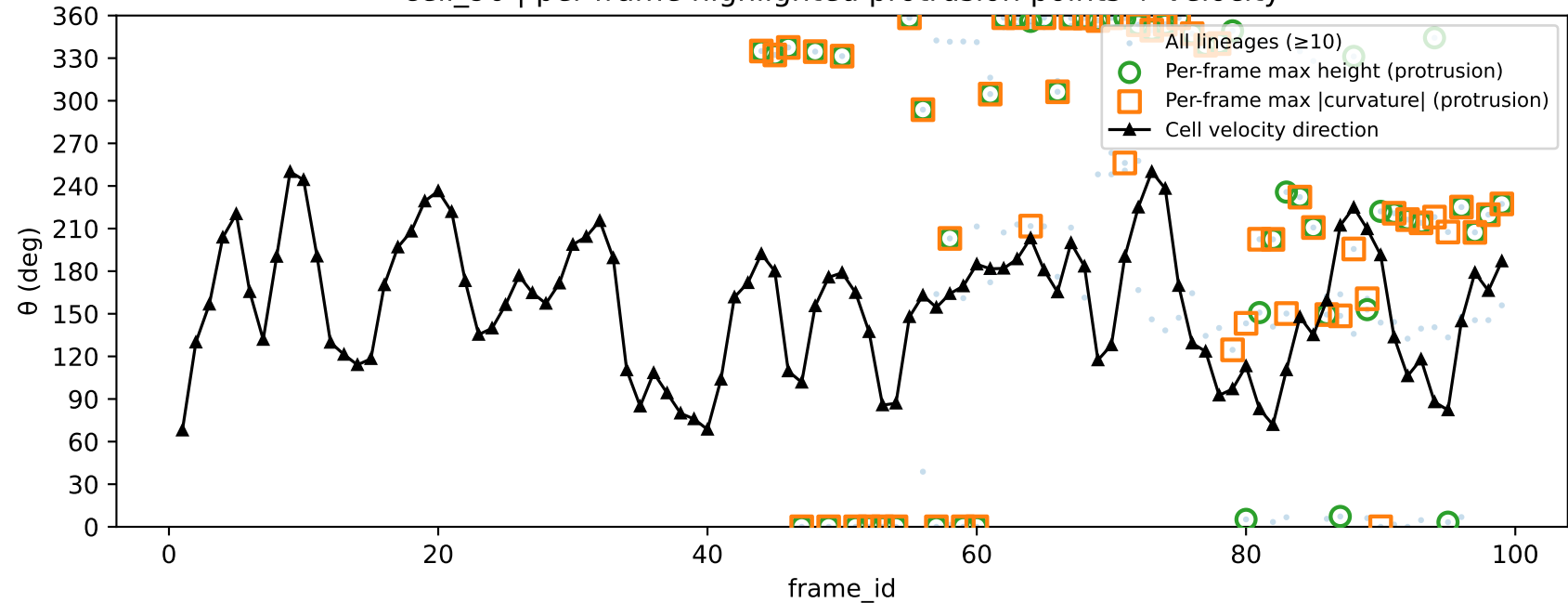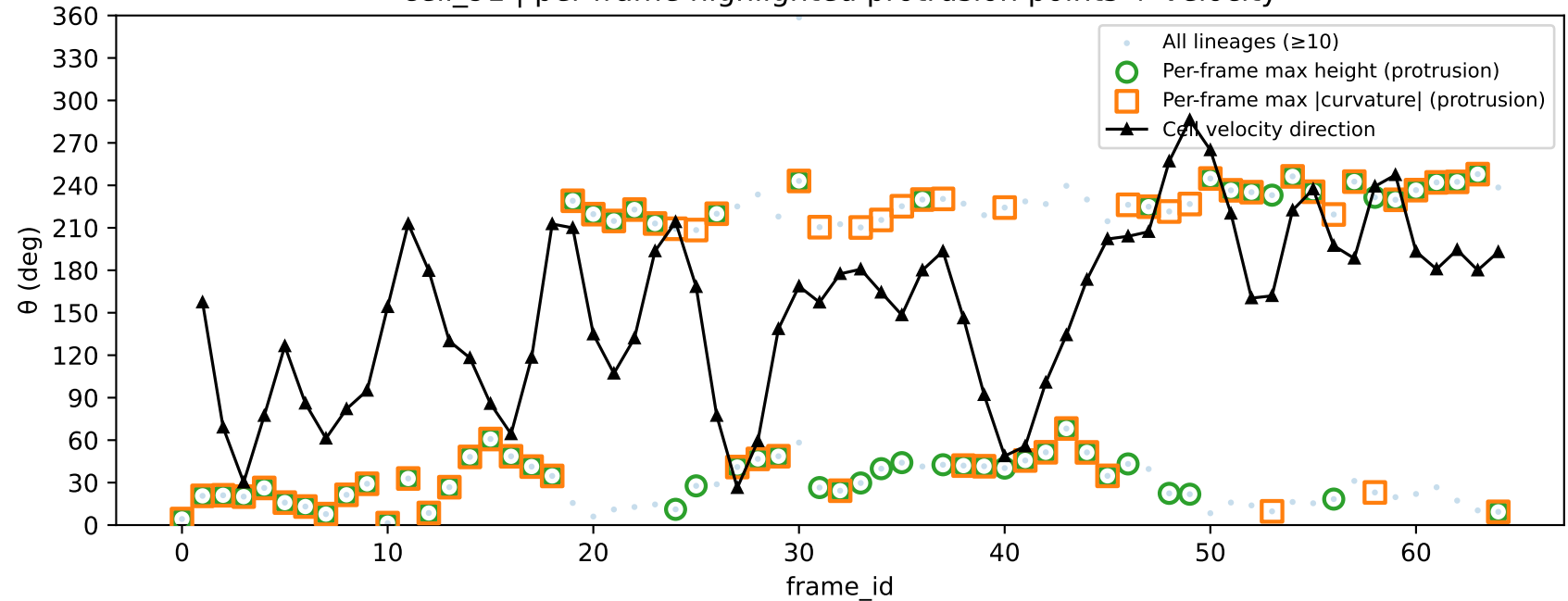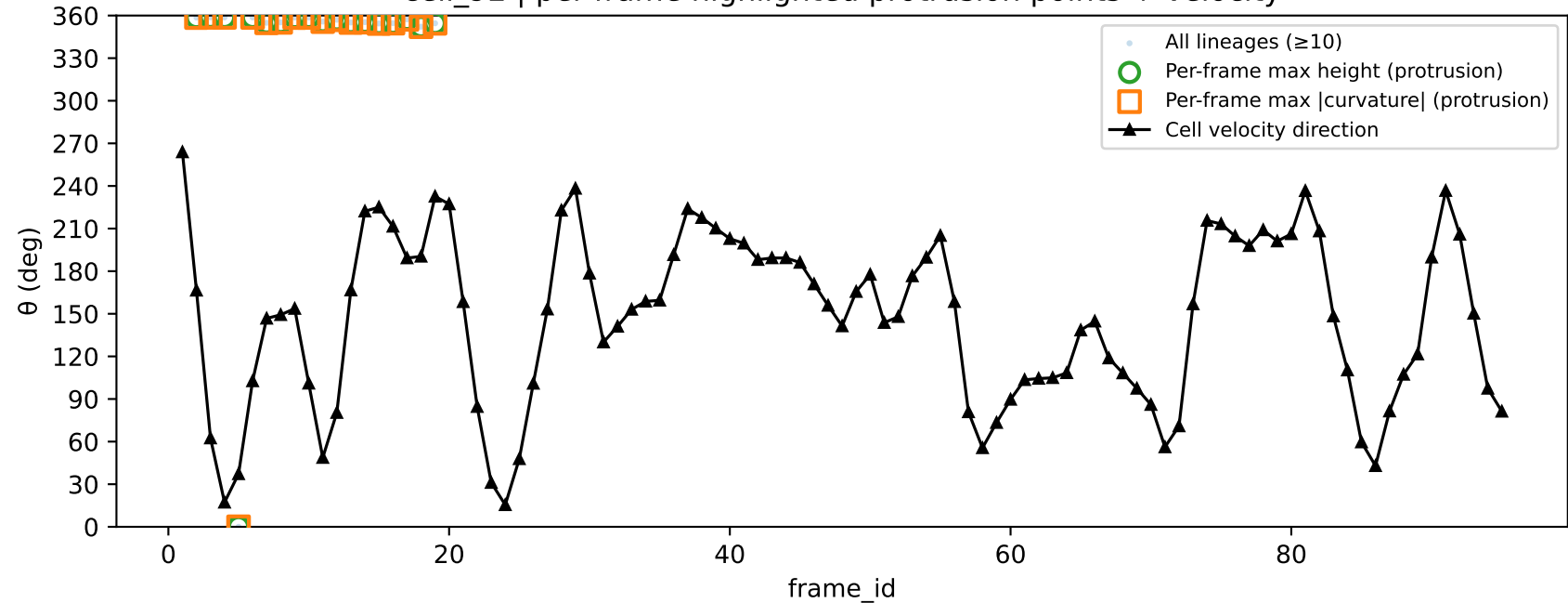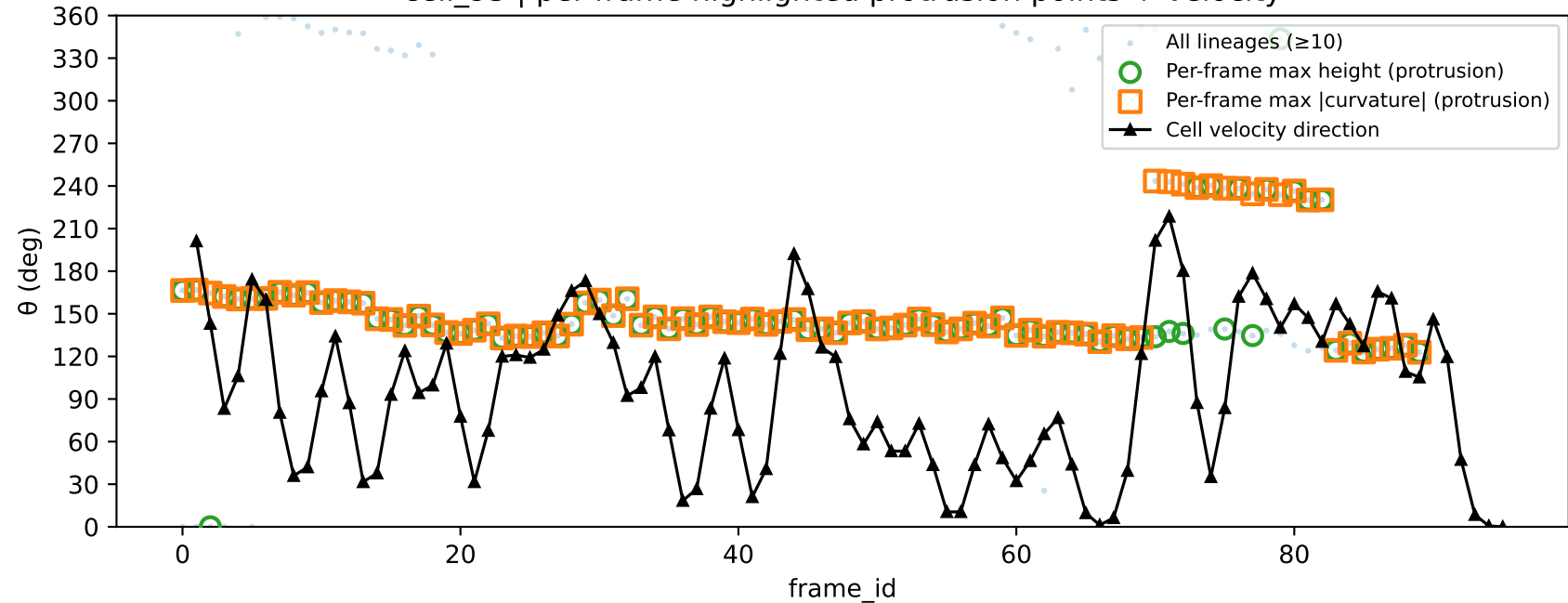cell_80 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

cell_81 | per-frame highlighted protrusion points + velocity

cell_82 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

X-axis: frame_id
Y-axis: θ (deg)

cell_84 | per-frame highlighted protrusion points + velocity

cell_85 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

x-axis: frame_id
y-axis: θ (deg)

cell_86 | per-frame highlighted protrusion points + velocity

cell_87 | per-frame highlighted protrusion points + velocity

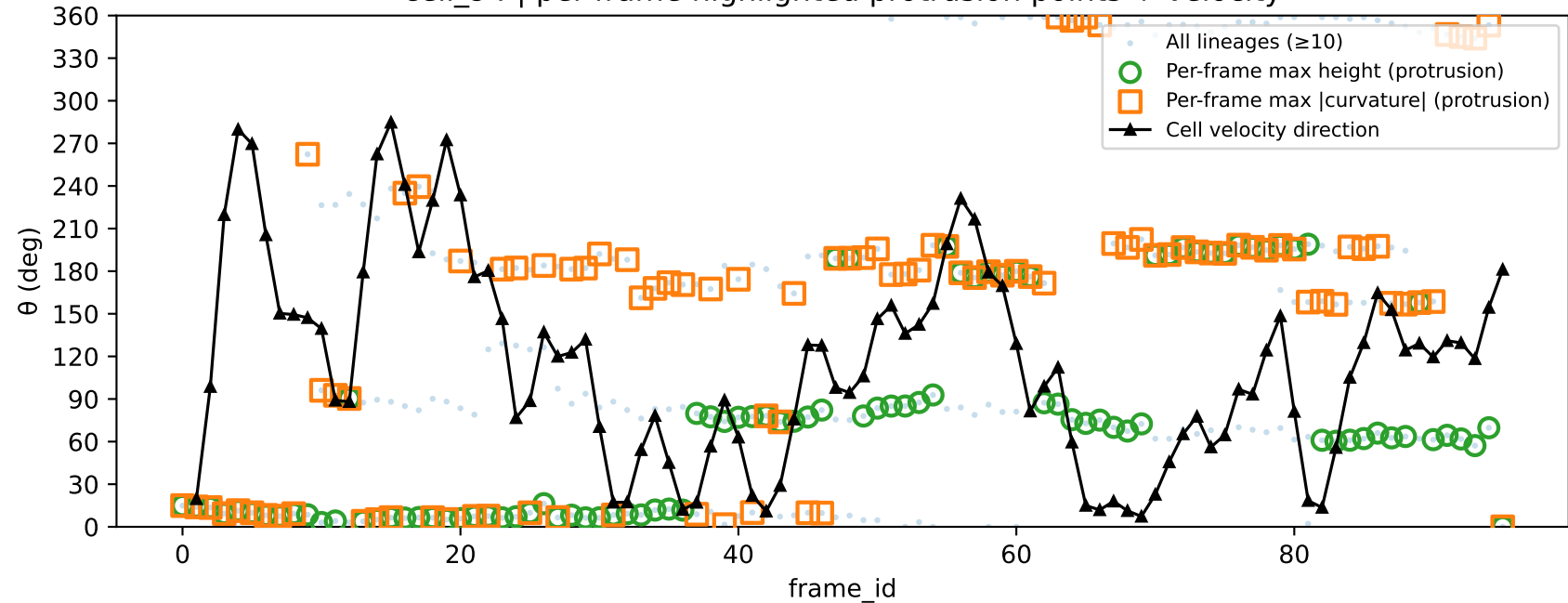cell_88 | per-frame highlighted protrusion points + velocity

cell_89 | per-frame highlighted protrusion points + velocity

cell_90 | per-frame highlighted protrusion points + velocity

cell_91 | per-frame highlighted protrusion points + velocity

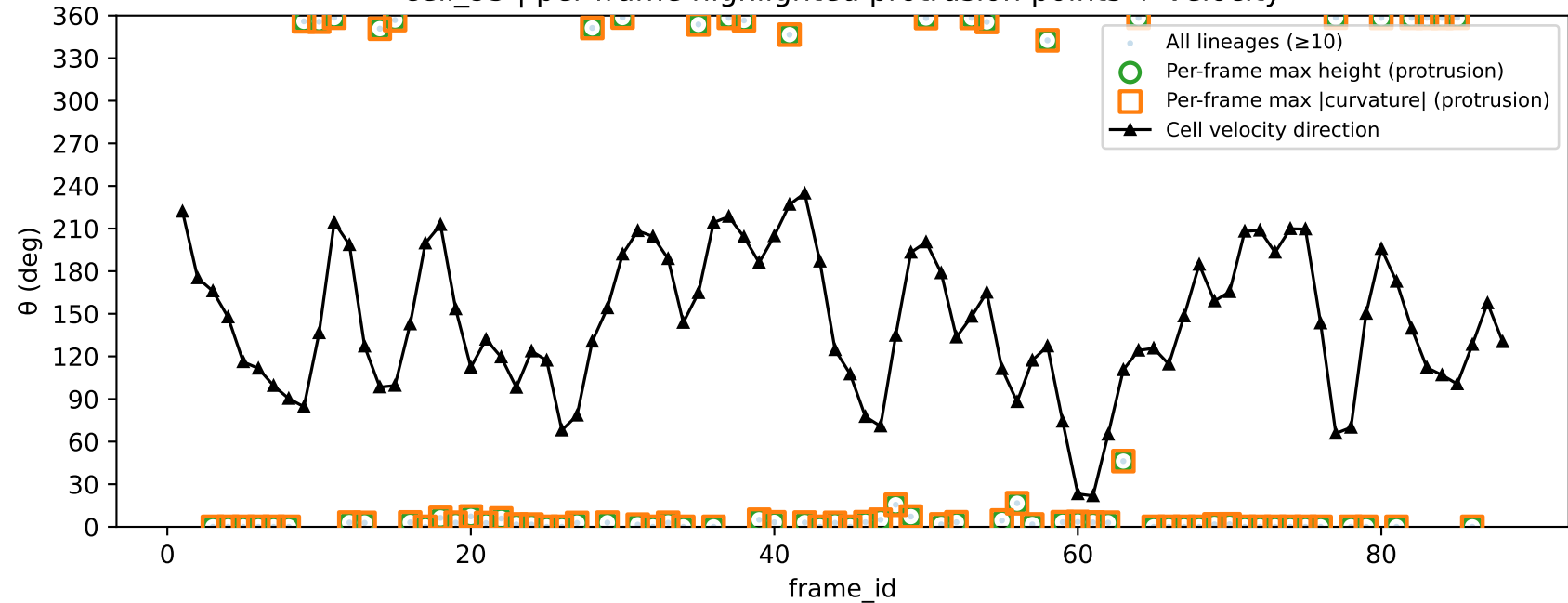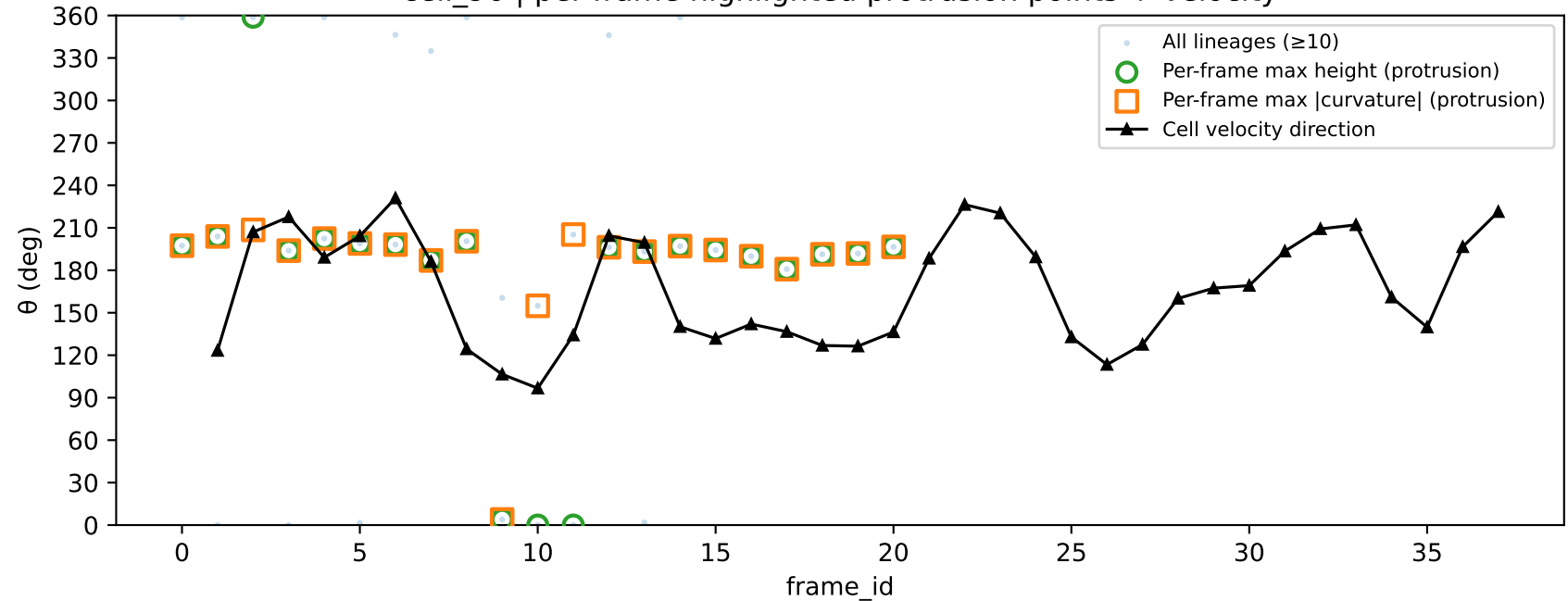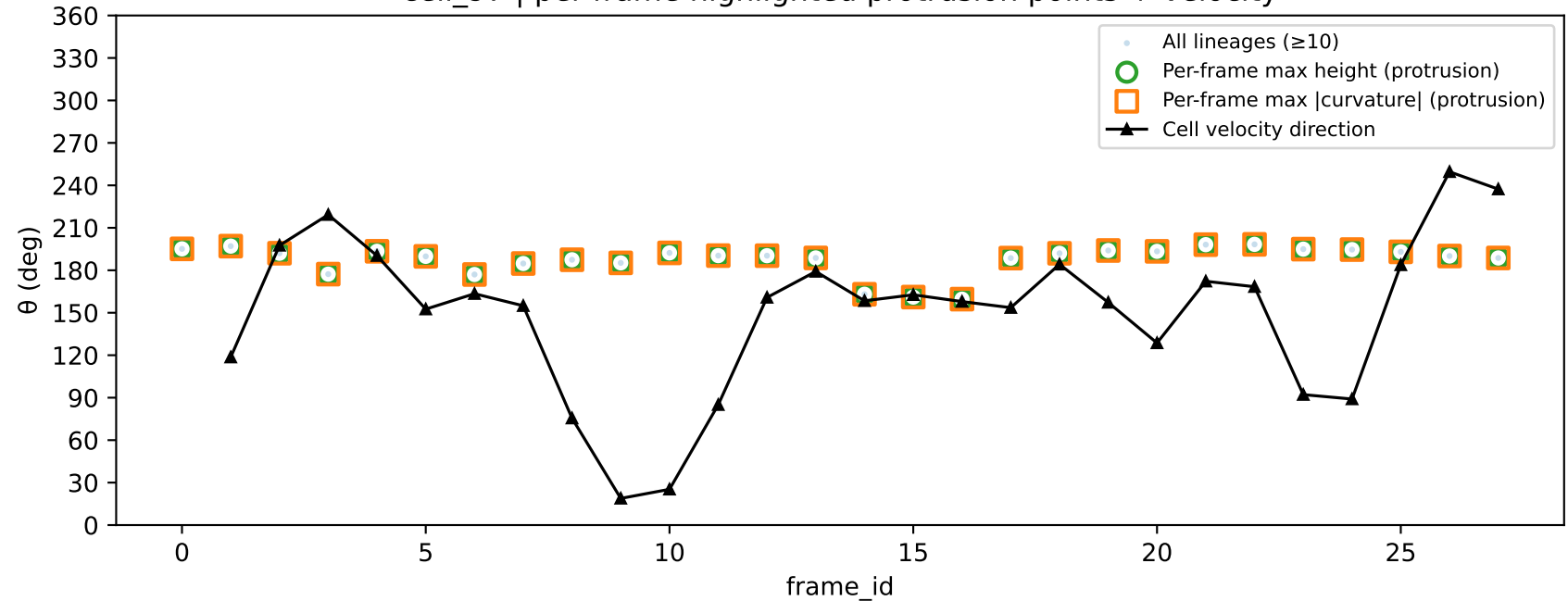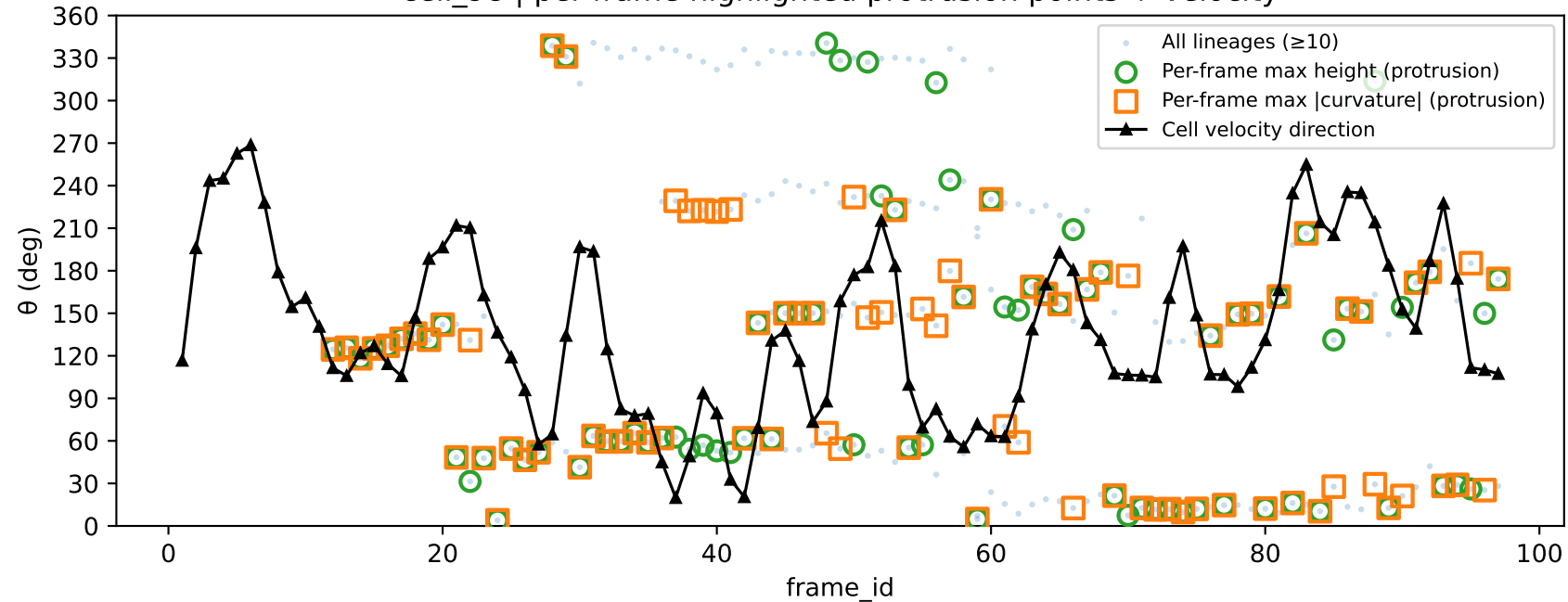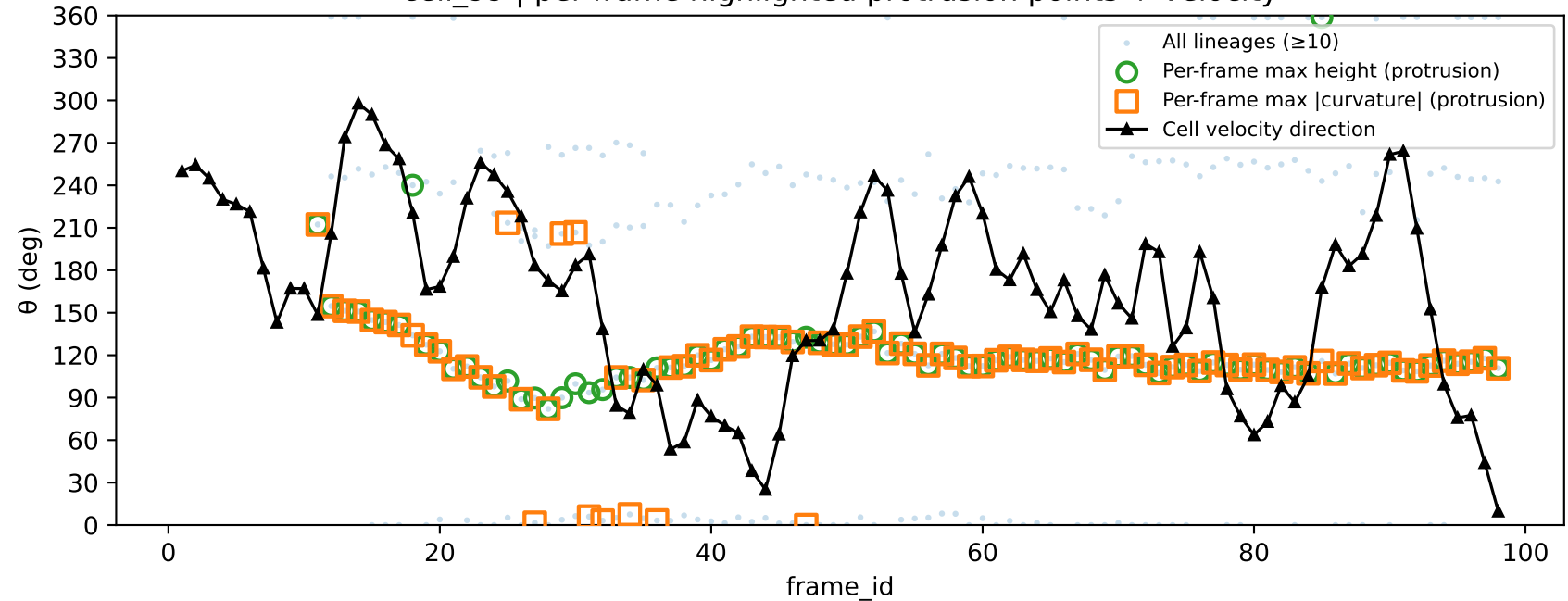cell_92 | per-frame highlighted protrusion points + velocity

cell_93 | per-frame highlighted protrusion points + velocity
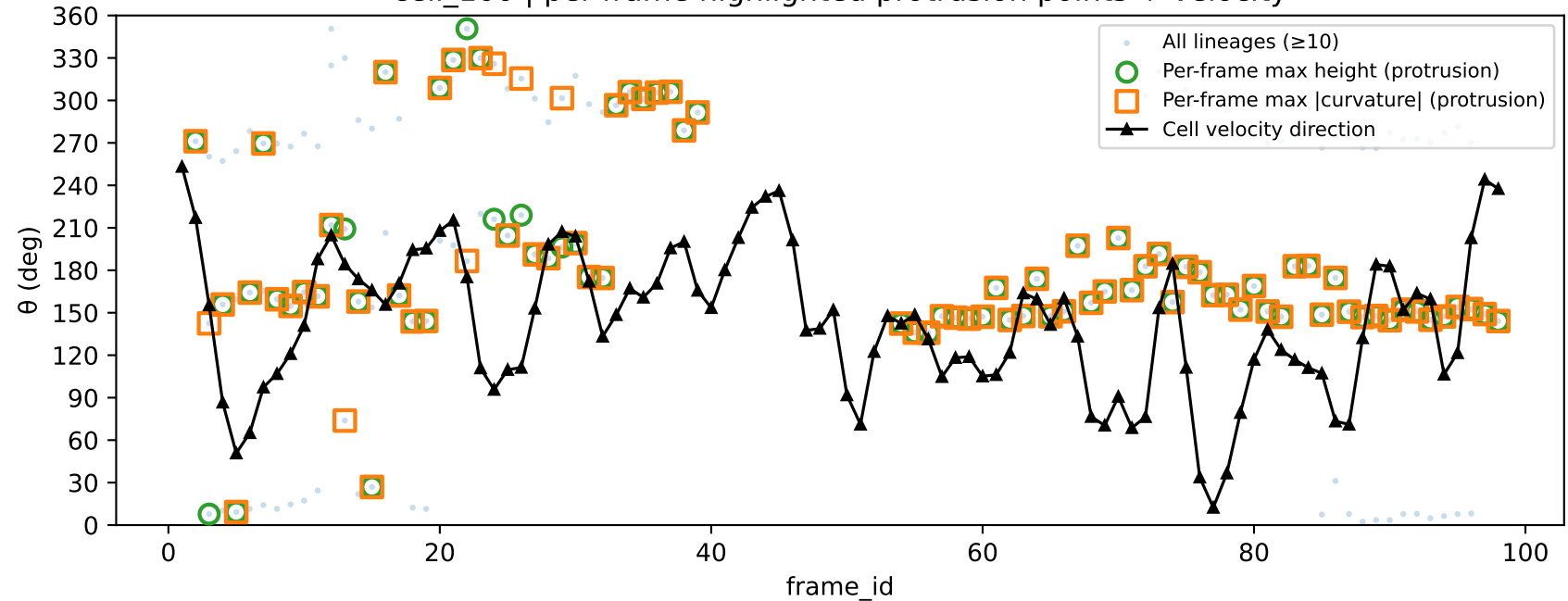
cell_94 | per-frame highlighted protrusion points + velocity

cell_95 | per-frame highlighted protrusion points + velocity

cell_96 | per-frame highlighted protrusion points + velocity

cell_97 | per-frame highlighted protrusion points + velocity

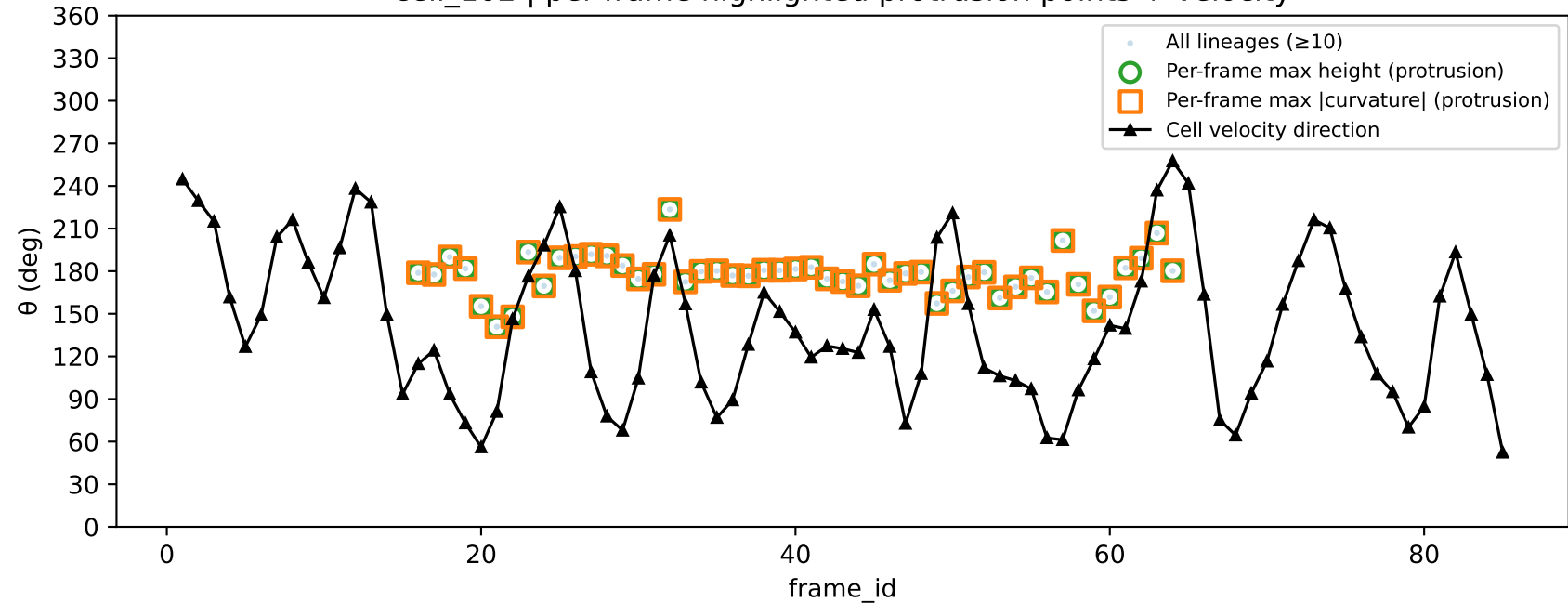cell_98 | per-frame highlighted protrusion points + velocity

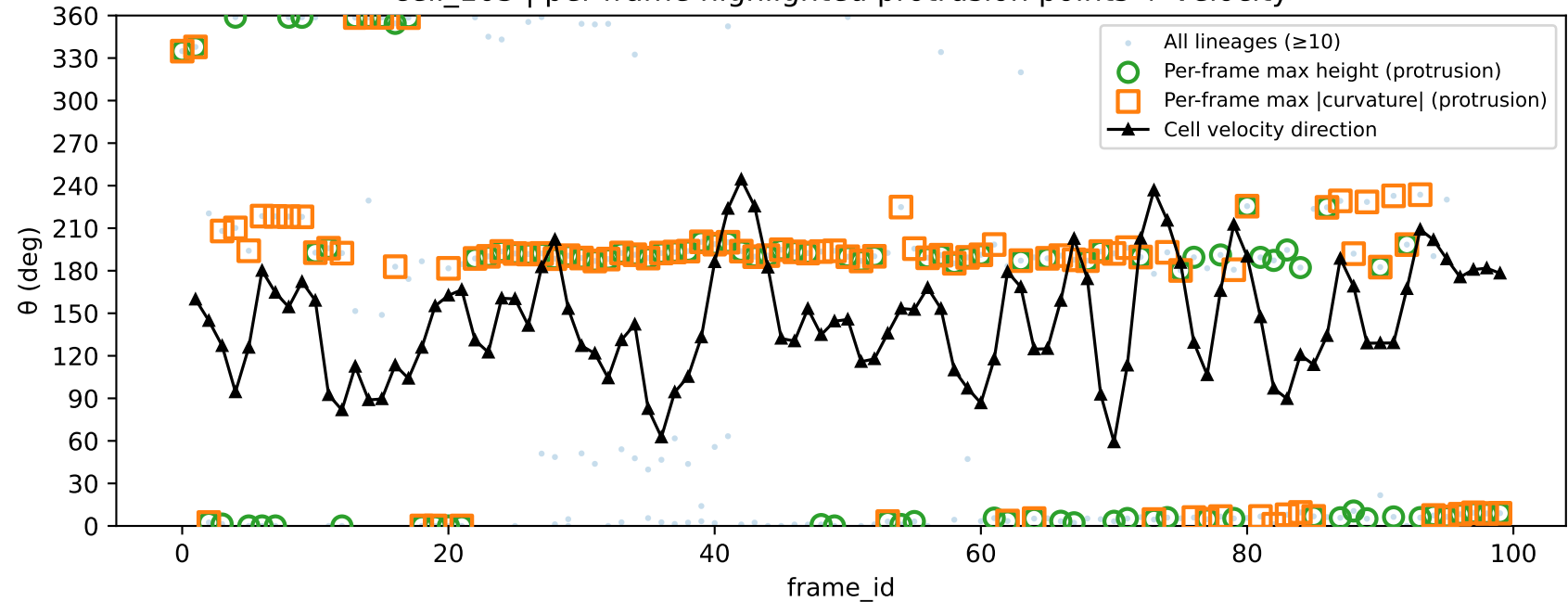cell_99 | per-frame highlighted protrusion points + velocity

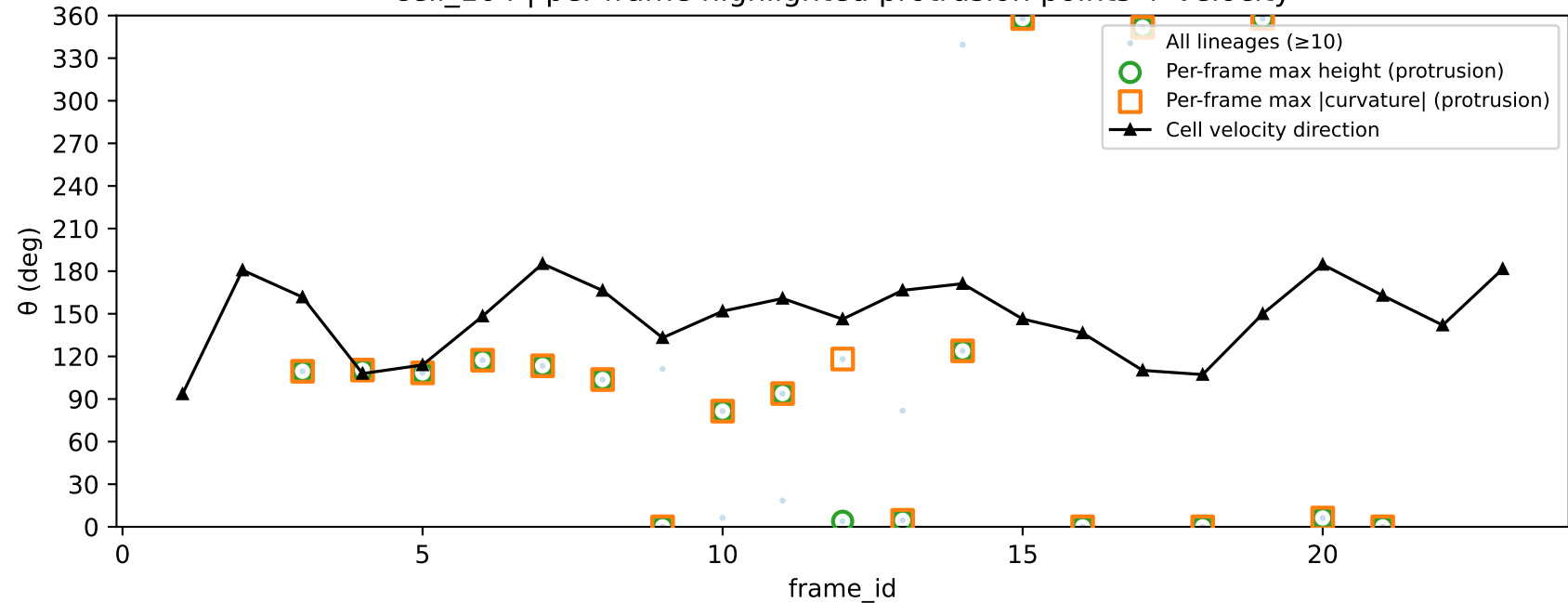cell_100 | per-frame highlighted protrusion points + velocity

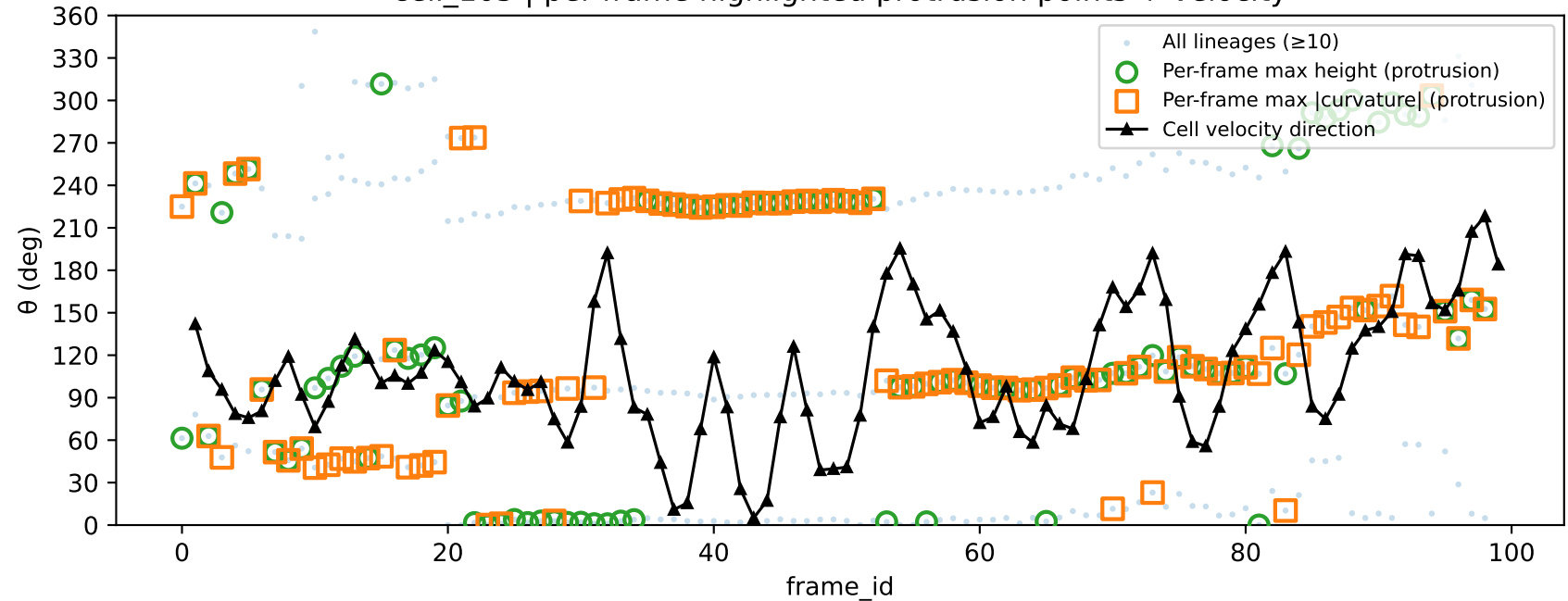cell_102 | per-frame highlighted protrusion points + velocity

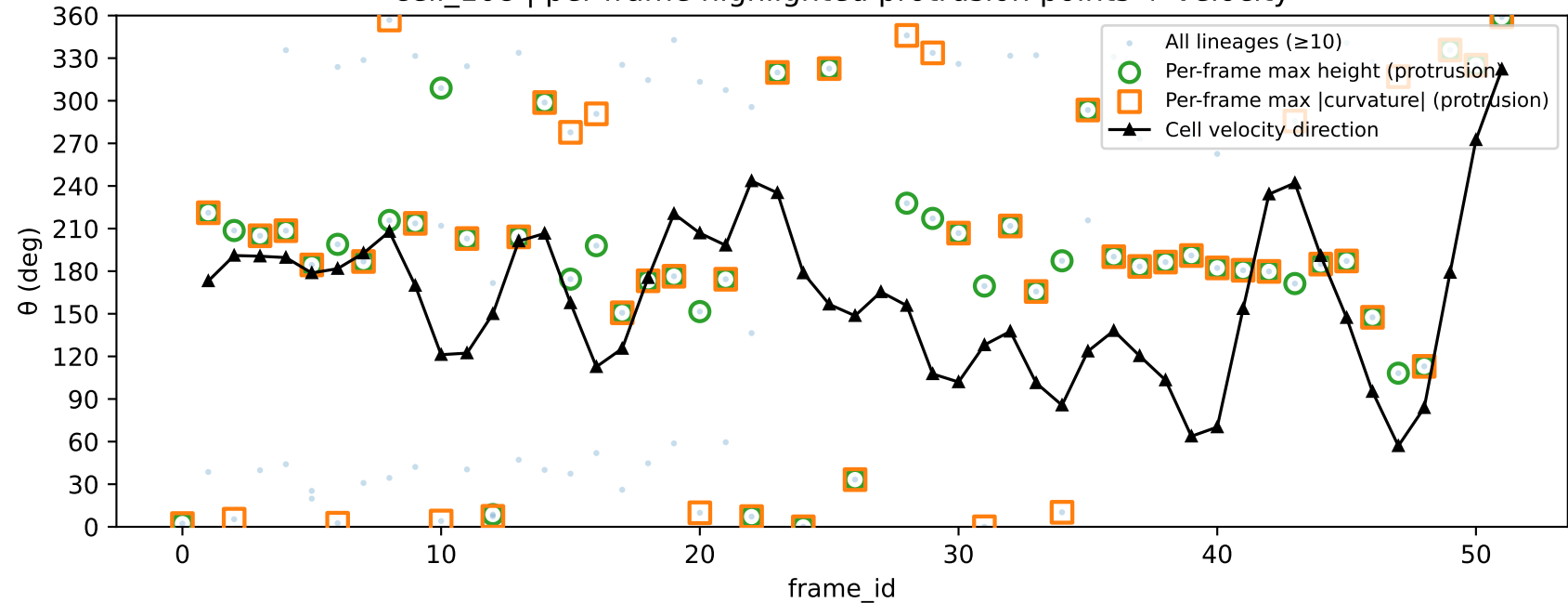cell_103 | per-frame highlighted protrusion points + velocity

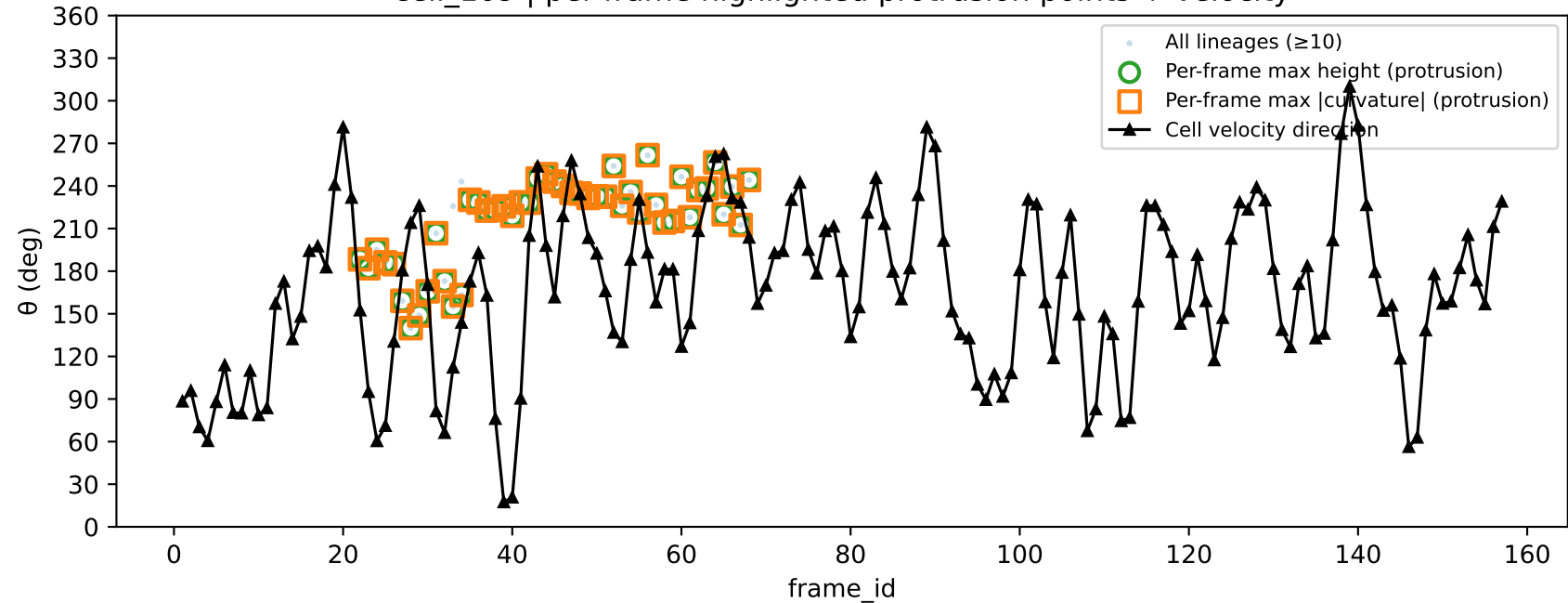cell_104 | per-frame highlighted protrusion points + velocity

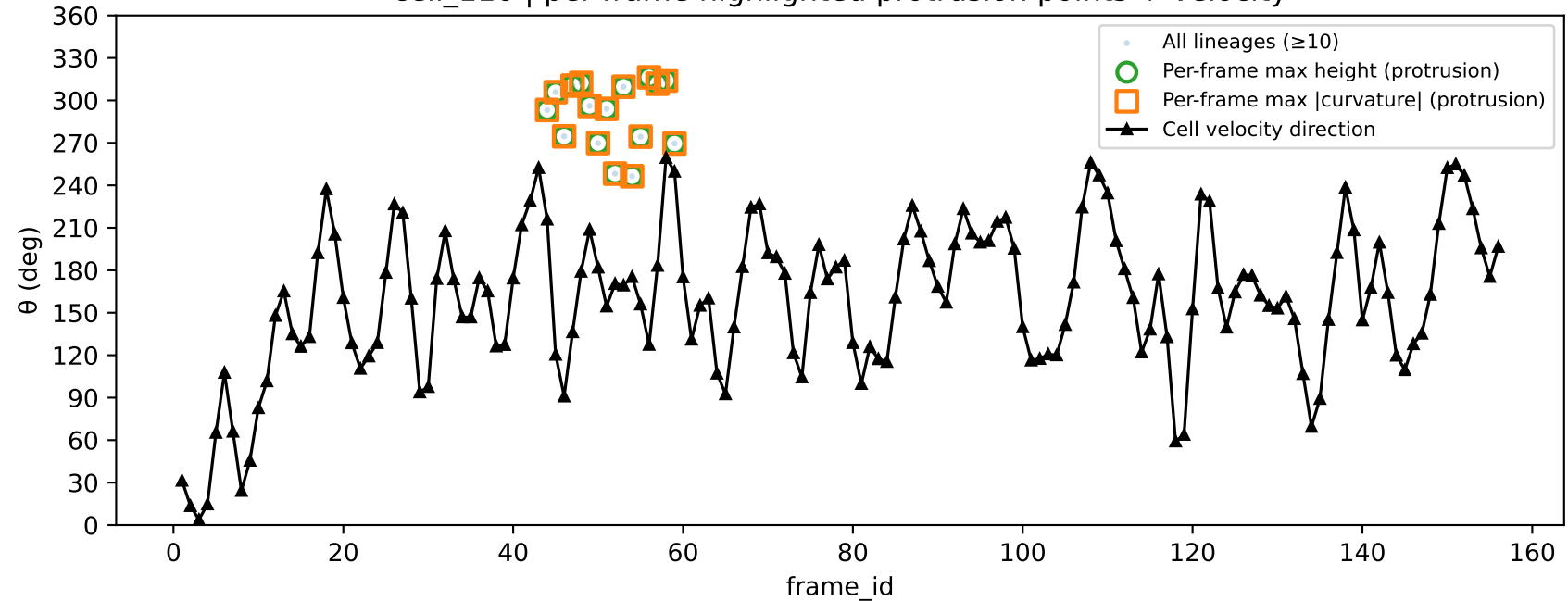cell_105 | per-frame highlighted protrusion points + velocity

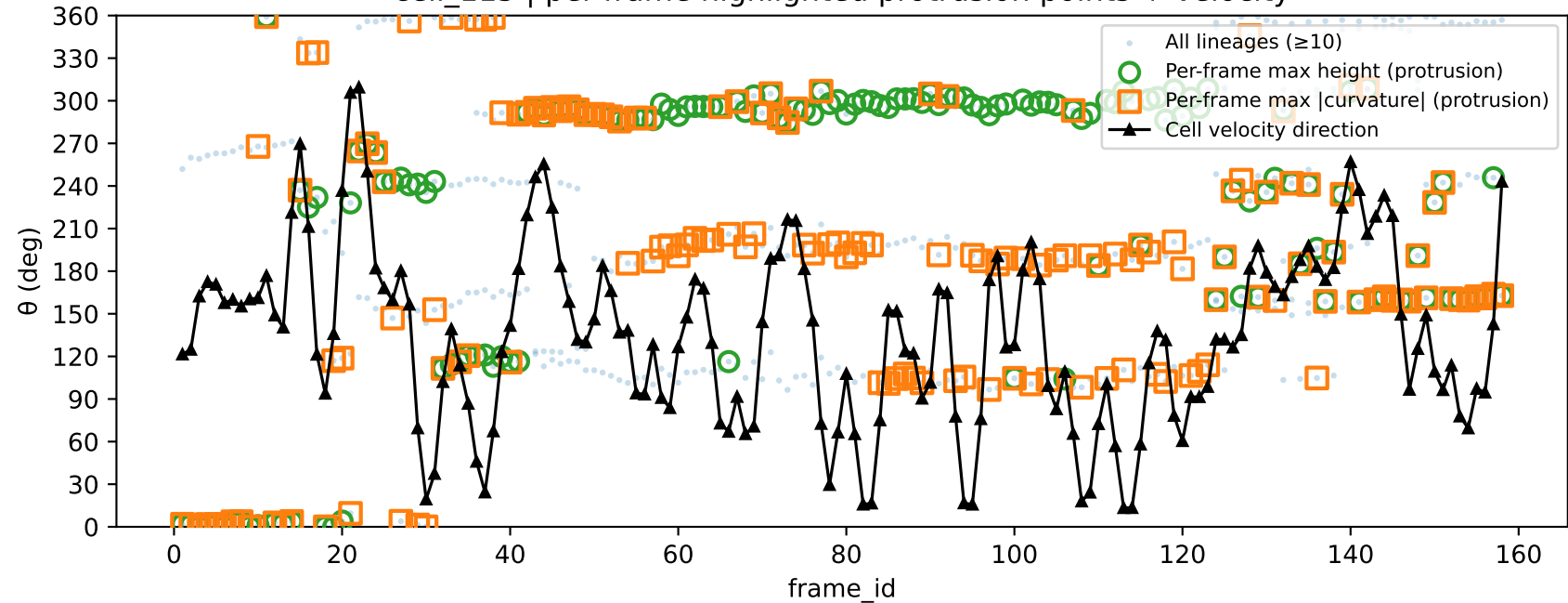cell_108 | per-frame highlighted protrusion points + velocity

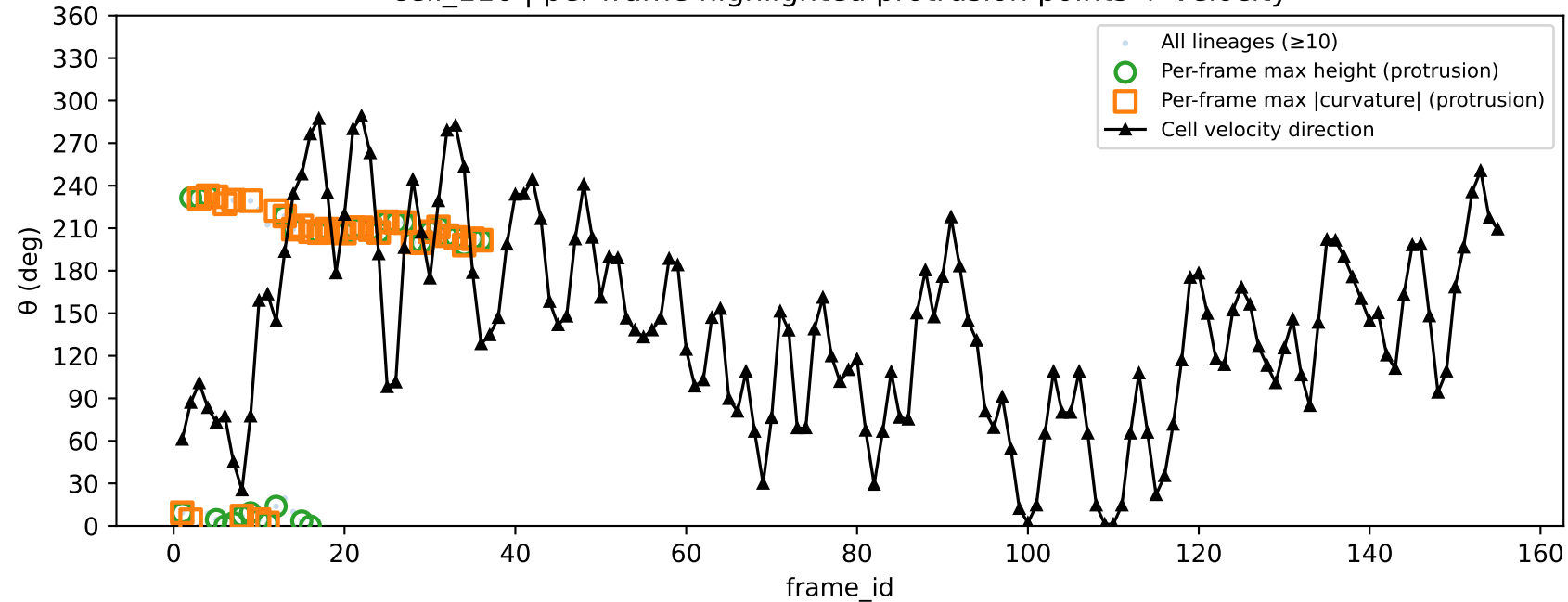cell_109 | per-frame highlighted protrusion points + velocity

cell_110 | per-frame highlighted protrusion points + velocity

cell_115 | per-frame highlighted protrusion points + velocity

cell_116 | per-frame highlighted protrusion points + velocity

cell_117 | per-frame highlighted protrusion points + velocity
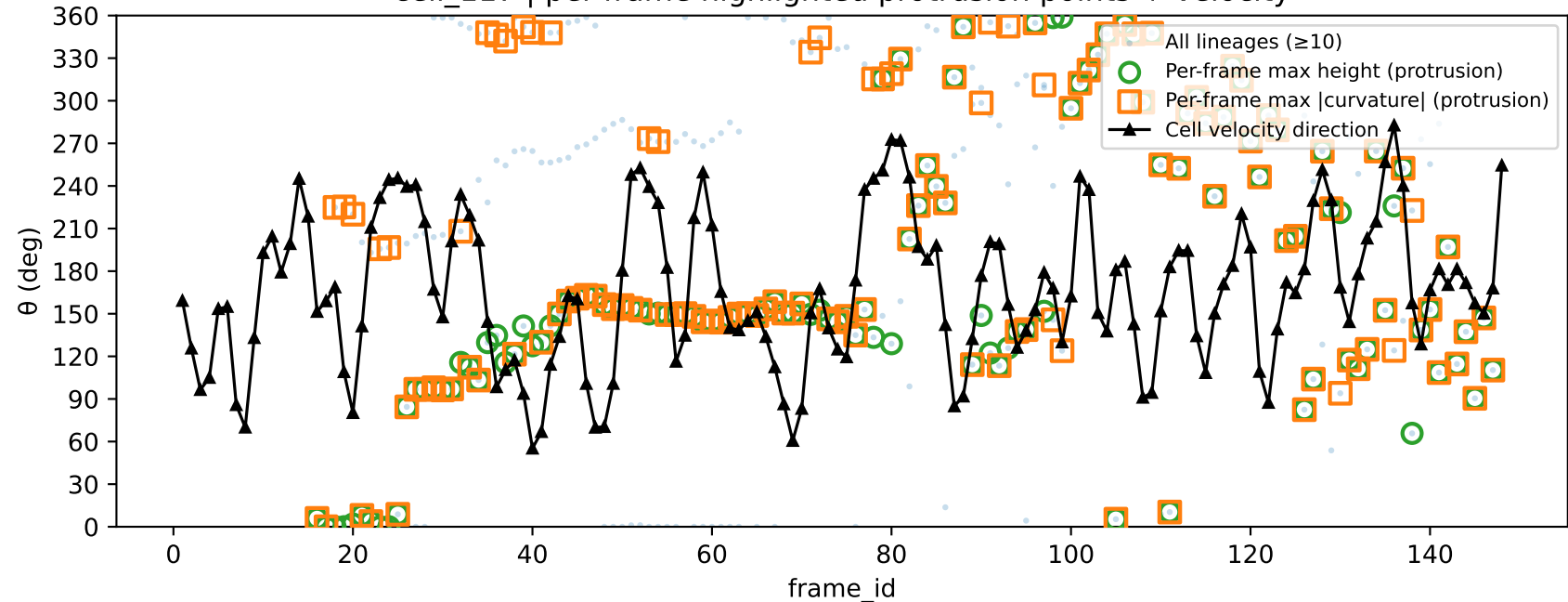
Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

cell_118 | per-frame highlighted protrusion points + velocity

cell_119 | per-frame highlighted protrusion points + velocity

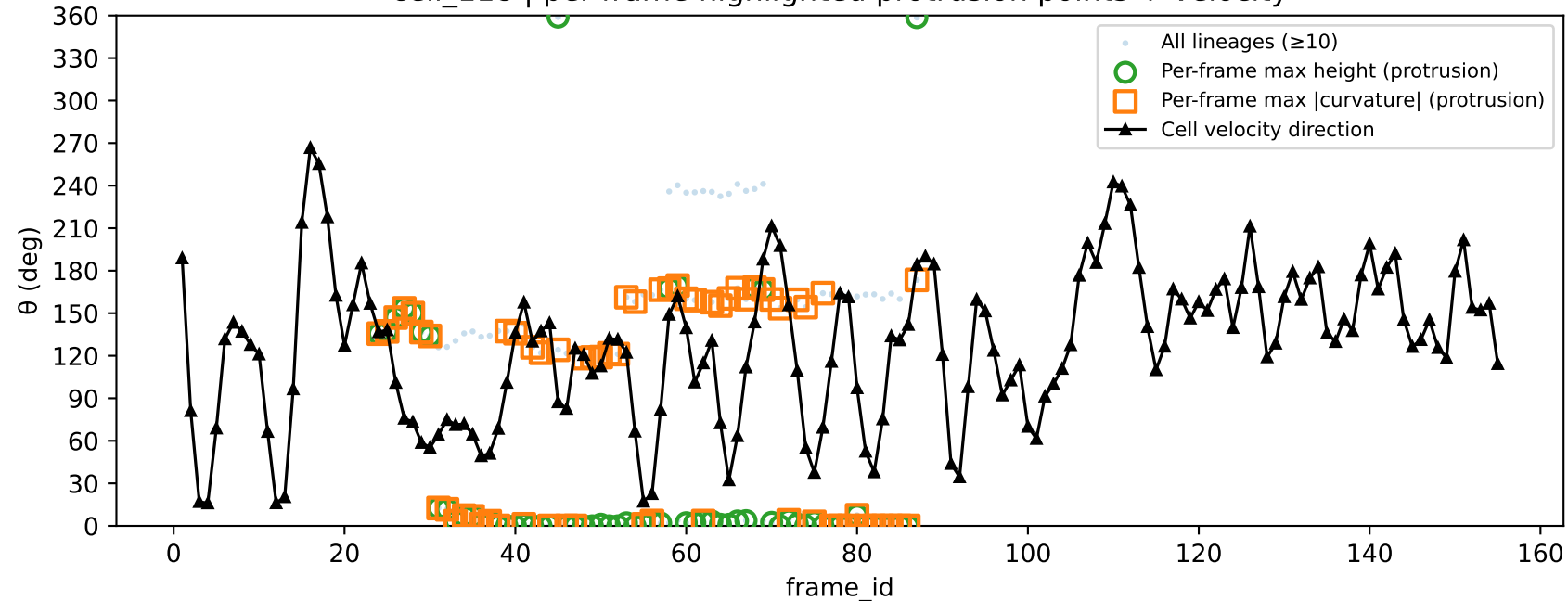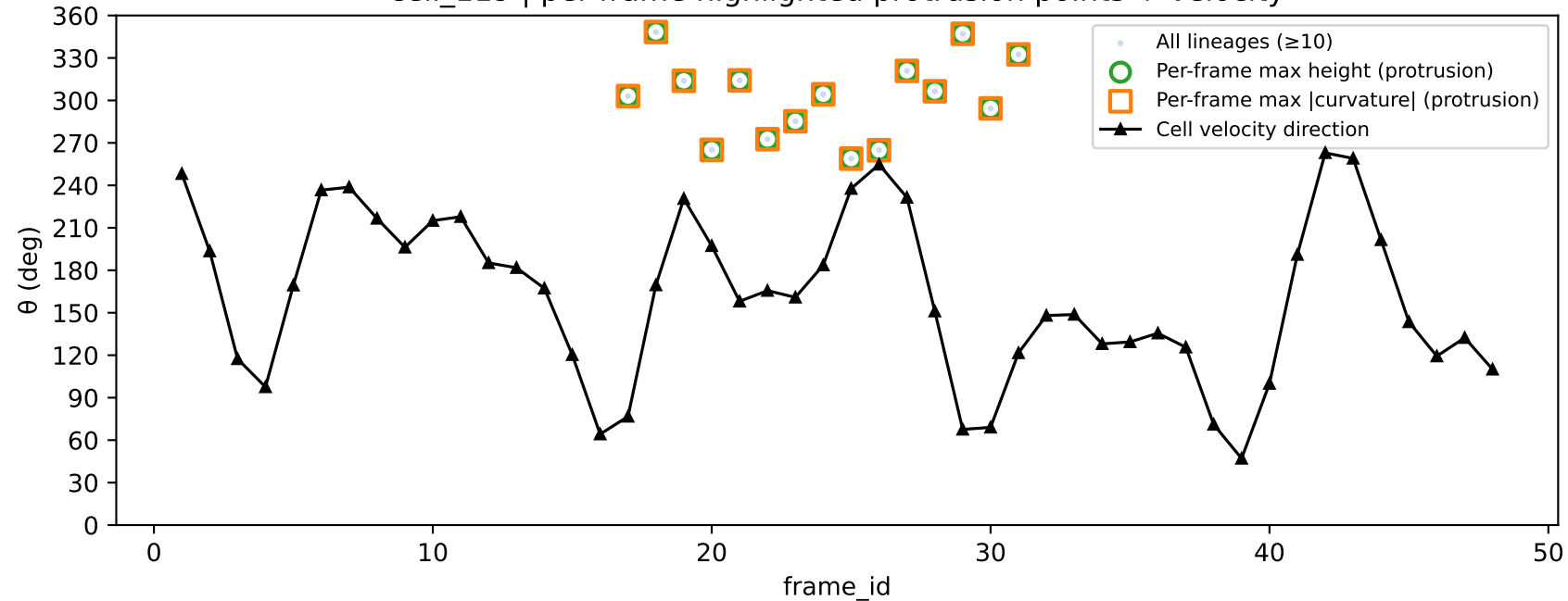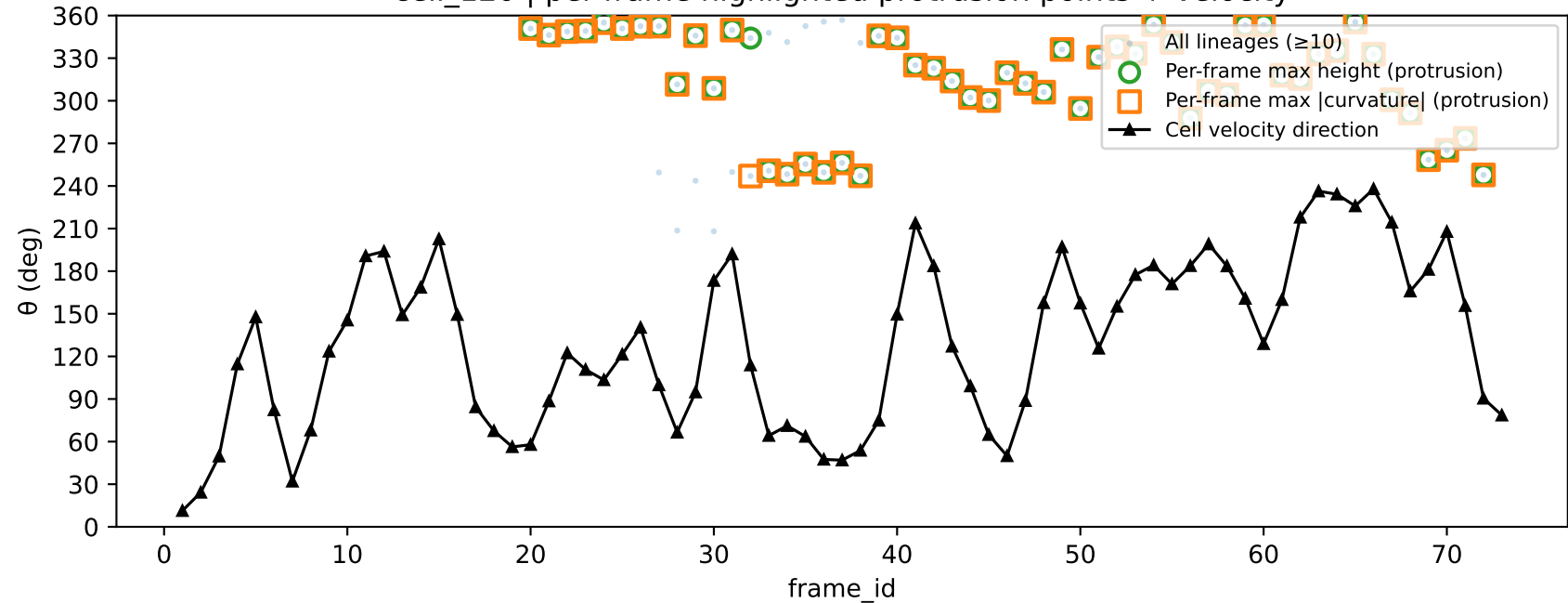cell_120 | per-frame highlighted protrusion points + velocity

Legend:
- All lineages (≥10)
- Per-frame max height (protrusion)
- Per-frame max |curvature| (protrusion)
- Cell velocity direction

cell_121 | per-frame highlighted protrusion points + velocity