

Good research deserves a clear figure.

From the research question to the visual argument.

Four original semiconductor studies, sixteen coordinated panels and reusable source-linked materials. A portfolio of research support, scientific figures and manuscript communication.

AFM · Metrology

The uncertainty floor

94.53% / 23.24%

95% interval coverage at 128 readings

Separate independent read noise from shared calibration error before trusting a smaller error bar.

PVD · Particle transport

Direction changes the answer

53.33% / 93.33%

Bottom first contacts / opening arrivals

Reveal the angular dependence hidden by separate directional summaries.

ALD · Process inference

Delivery can bias a fitted rate

0.7813 / 3.0000

Fitted rate multipliers; true values = 1

Connect inlet history, surface response and prediction on unseen pulse conditions.

HAR etch · Identifiability

One more observation matters

26.25–41.25 eV

Bottom energy per incident member

Show what separate angle and energy distributions leave unidentified.

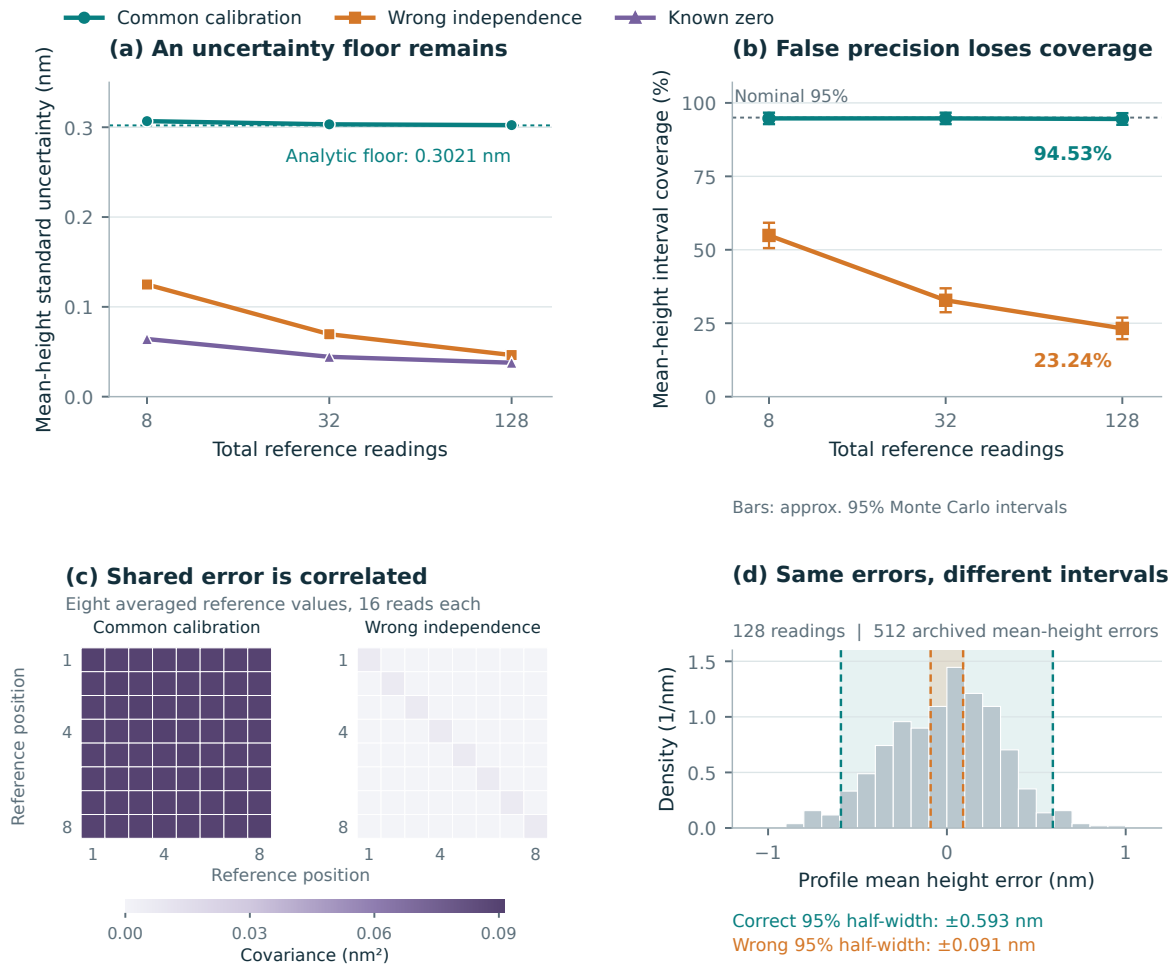
All four cases are synthetic numerical studies. Numerical checks apply within declared models; no instrument calibration, measured process performance, published-paper status or journal acceptance is implied.

More measurements. The same uncertainty floor.

Separate independent read noise from shared calibration error before trusting a smaller error bar.

More readings. A shared error remains.

AFM-inspired metrology model | 512 independently calibrated synthetic trials



Synthetic numerical study. Same estimates; only the uncertainty model changes. Not physical AFM calibration.

94.53% / 23.24% - Observed coverage of nominal 95% intervals at 128 readings

Scope: Synthetic measurement model. The quantity is uncertainty in one profile's mean absolute height, not pixel RMSE or the uncertainty of a Monte Carlo grand mean. This is not an AFM instrument calibration.

SA-MET-VARIABILITY-UQ-068 · AFM reference-zero uncertainty · 2026-09-30

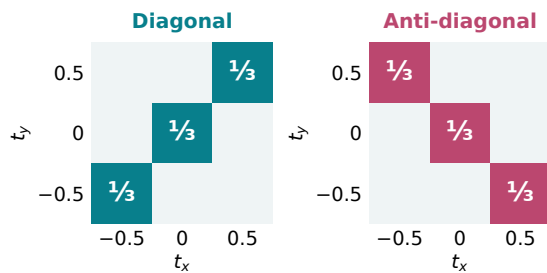
The same marginals. A different arrival pattern.

Reveal the angular dependence hidden by separate directional summaries.

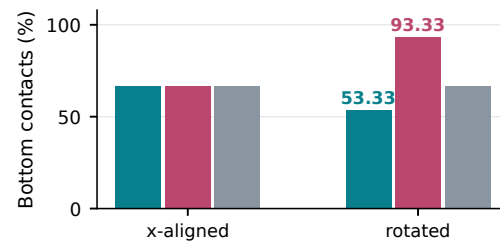
The same marginals can hide different feature responses

PVD transport insight | Original nine-direction model | No measured data

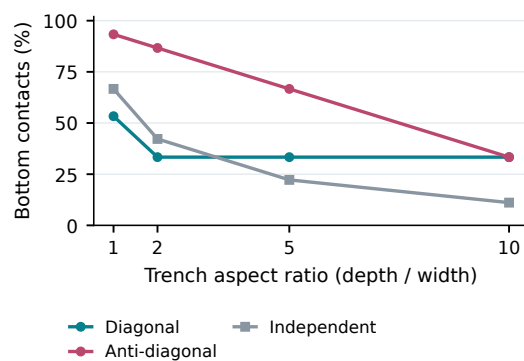
(a) Correlation hidden by the marginals



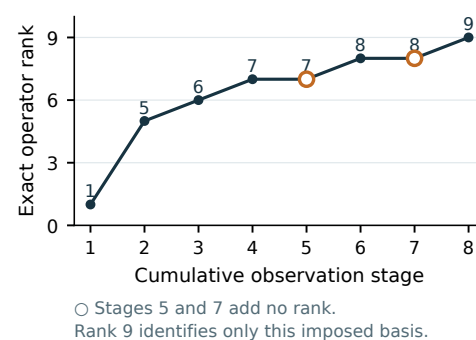
(b) Rotation reveals the difference



(c) Geometry changes the response



(d) More signals need not add information



Stages: 1 total; 2 complete x/y marginals; 3 + rotated bottom (AR 1); 4 + rotated bottom (AR 5);
5 + rotated imbalance (AR 1); 6 + rotated imbalance (AR 5); 7 + orthogonal bottom (AR 5);
8 + orthogonal imbalance (AR 5). Imbalance = right minus left; orthogonal vector = (-0.8, 0.6).
Denominator: arrivals through the opening. Static first-contact geometry; not film thickness or calibrated detector inversion.

53.33% / 93.33% - Bottom first-contact fractions for two joint distributions in the rotated aspect-1 feature

Scope: A prescribed nine-direction model with fixed geometry. First contact is not deposited thickness. Finite-basis rank does not establish continuous angular uniqueness, measured chamber calibration or material-specific growth.

SA-PROC-DEP-PVD-012 · Angular observability, unit 008 · 2026-10-02

Separate the delivery from the reaction.

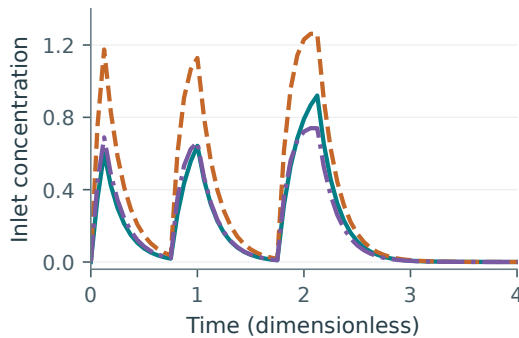
Connect inlet history, surface response and prediction on unseen pulse conditions.

Delivery history changes what reaction rates appear to mean

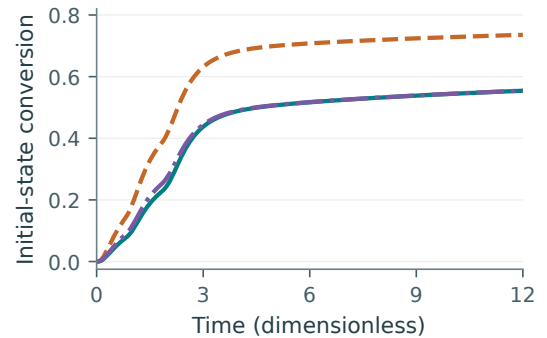
ALD half-reaction model | Original dimensionless synthetic study

— Single pole - - - Buffer: same command - - - Buffer: equal total dose

(a) Unseen short-pulse inlet

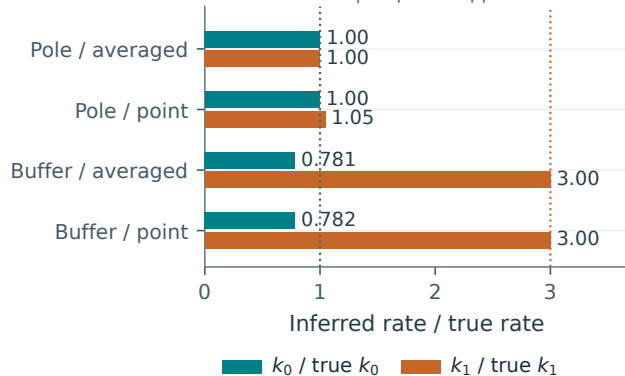


(b) Surface-state response

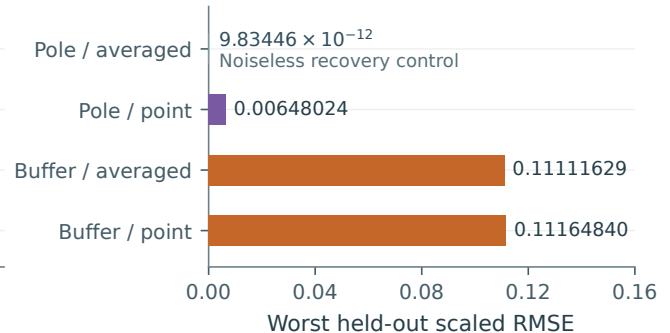


(c) Training-only rate inference

True value = 1 | Imposed upper bound = 3



(d) Held-out model error



Linear scale; same two unseen histories

Numerically verified model; no measured calibration. Conversion is not film thickness or growth per cycle.

Rate bars at 3 reach the imposed bound. No confidence intervals estimated. Curves join saved samples without smoothing.

0.7813 / 3.0000 - Fitted rate multipliers for buffer truth with averaged observations; true values are 1 and 1

Scope: Dimensionless, noiseless and well-mixed half-reaction model with fixed wall and sensor assumptions. Conversion is not film thickness or growth per cycle. Scaled RMSE is not a percentage or a noise estimate.

SA-PROC-ALD-TRANSIENT-002 · Delivery-buffer comparison, ALD016 · 2026-09-18

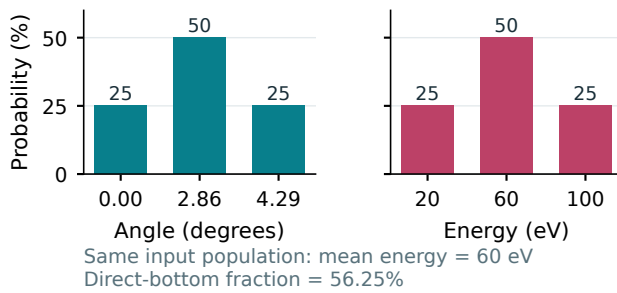
The same marginals can tell different stories.

Show what separate angle and energy distributions leave unidentified.

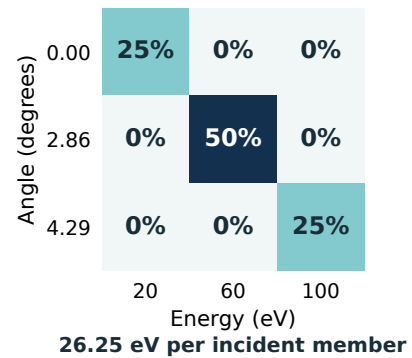
Angle-energy dependence and trench energy delivery

Original synthetic study | Fixed trench aspect ratio 10 | No measured data

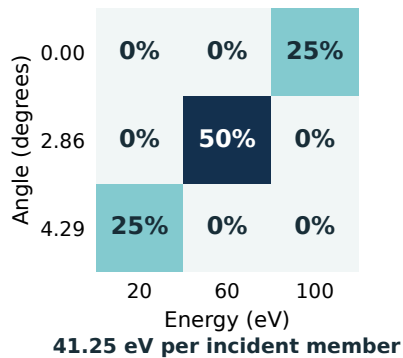
(a) Fixed marginal distributions



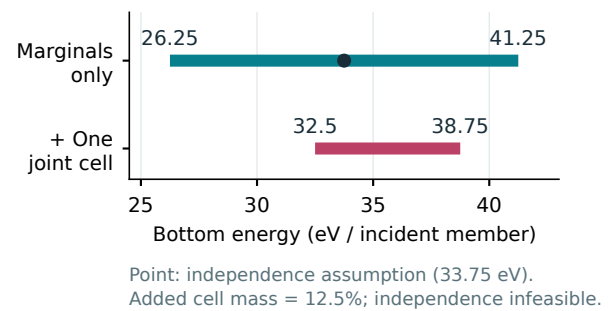
(b) Minimum-energy joint table



(c) Maximum-energy joint table



(d) Admissible energy ranges



Joint tables: probability mass; common 0-50% colour scale. Intervals: exact finite-table LP bounds.
Static absorbing geometry only; no reflection, etch rate, material yield or deposited heat inferred.

26.25–41.25 eV - Admissible bottom-delivered energy per incident population member with marginals alone

Scope: Synthetic prescribed probabilities and static first-contact geometry. These are admissible bounds, not confidence intervals.
Delivered projectile energy is not etch rate, deposited heat, flux or material yield.

SA-PROC-ETCH-HAR-011 · Angle-energy joint identification · 2026-09-27

Bring your question. Build the full story.

Start with one deliverable, or connect the pieces.

01 / Research support

Source-linked literature reviews, scoped numerical analysis, model comparisons and reproducibility packets.

02 / Scientific figures

Process and device diagrams, coordinated Figure 1 panels, plot refinement, captions and editable vector files.

03 / Covers and concept art

Original semiconductor visual concepts for research communication, presentations and cover proposals.

04 / Manuscript editing

Technical English, argument structure, figure-to-text consistency, marked-up edits and author queries.

A practical handover

Editable PDF/SVG artwork · Caption draft · Selected plot data · Redraw script · Methods and limitations note

Discuss scope, source materials, deliverables and revision needs at semiagora.com/research-studio.

These are original portfolio examples, not client outcomes. New measurements and physical validation require a separately agreed scope.