

Uncertainty Quantification for Electronic-System Design

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Uncertainty?

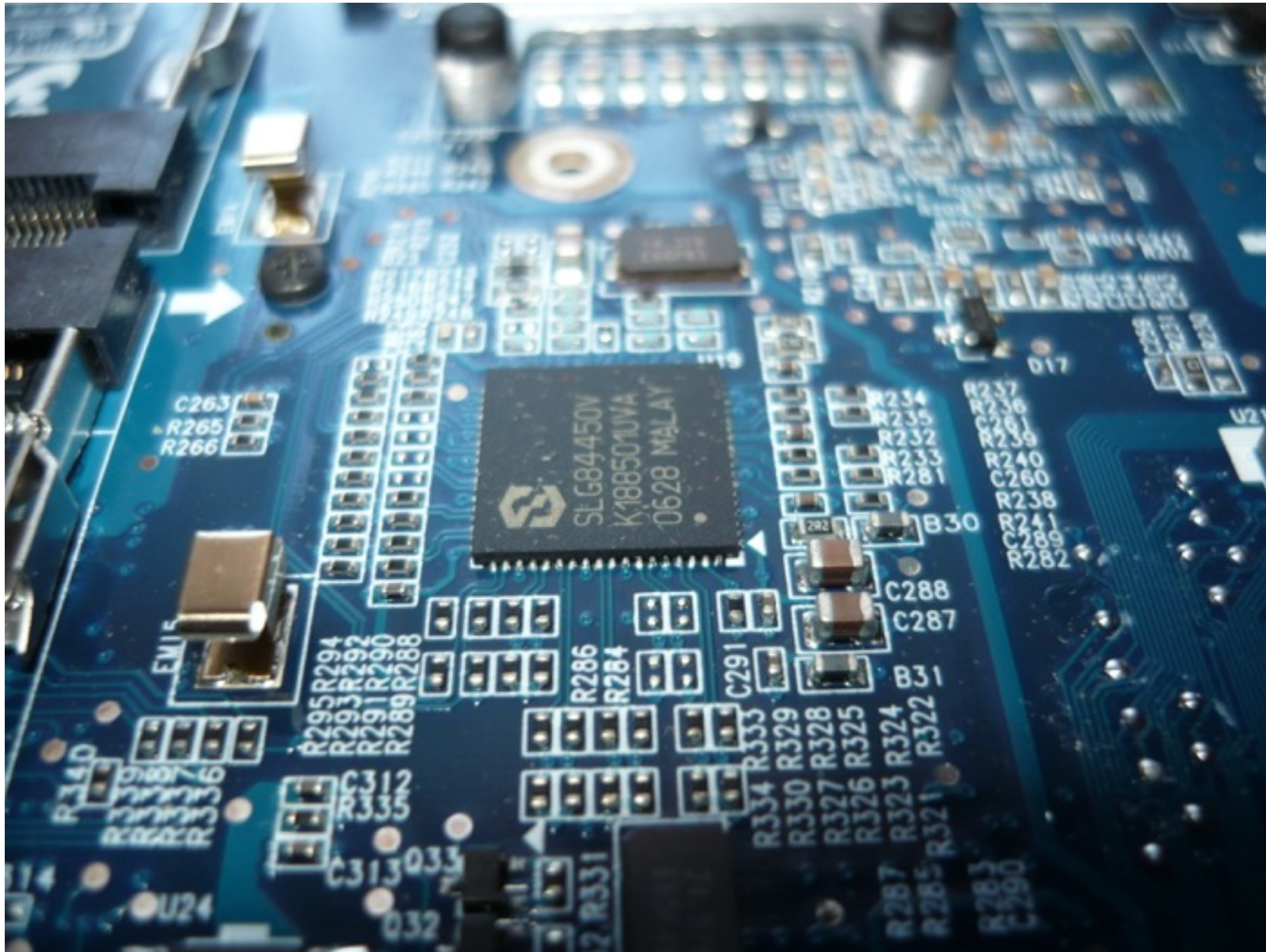


Photo: AAndrey A, <https://goo.gl/eFhcto>

Uncertainty?

- Process variation
- Environment
- Workload
- Aging

Fabrication

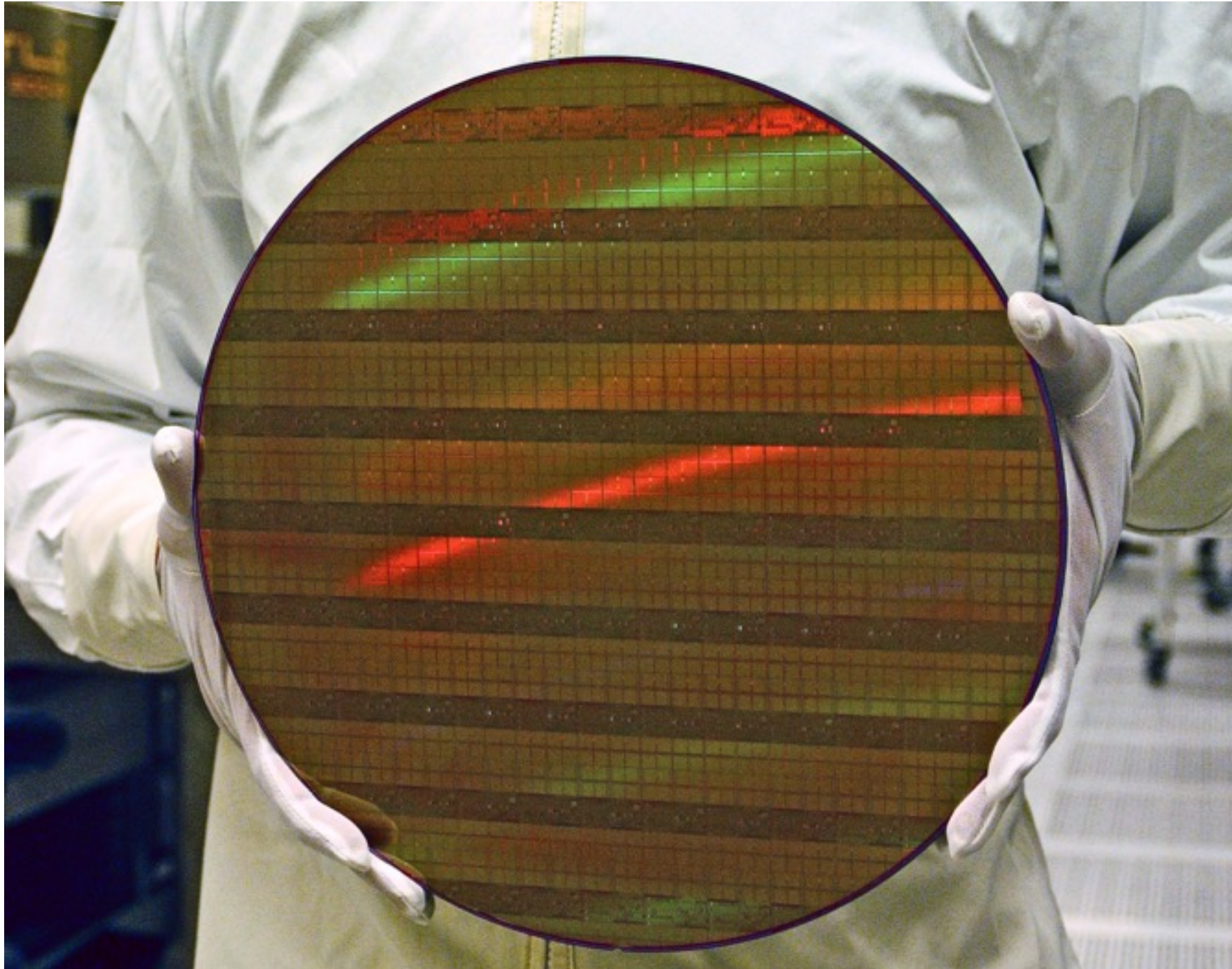
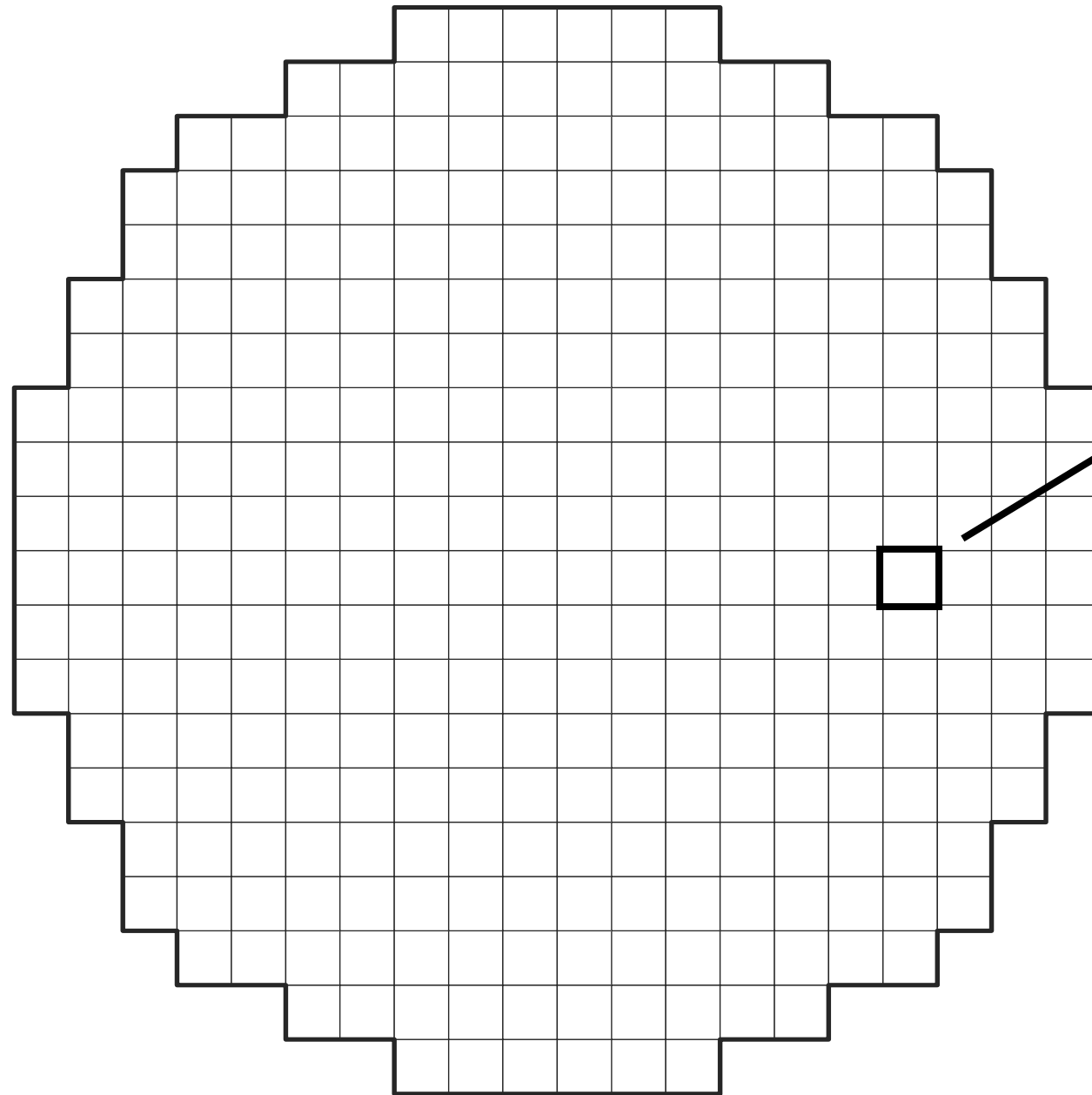


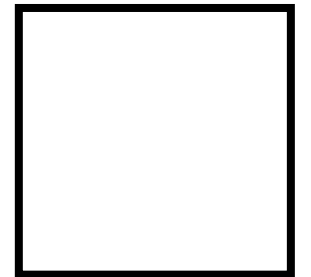
Photo: Intel, <https://goo.gl/mHMxe1>

Fabrication

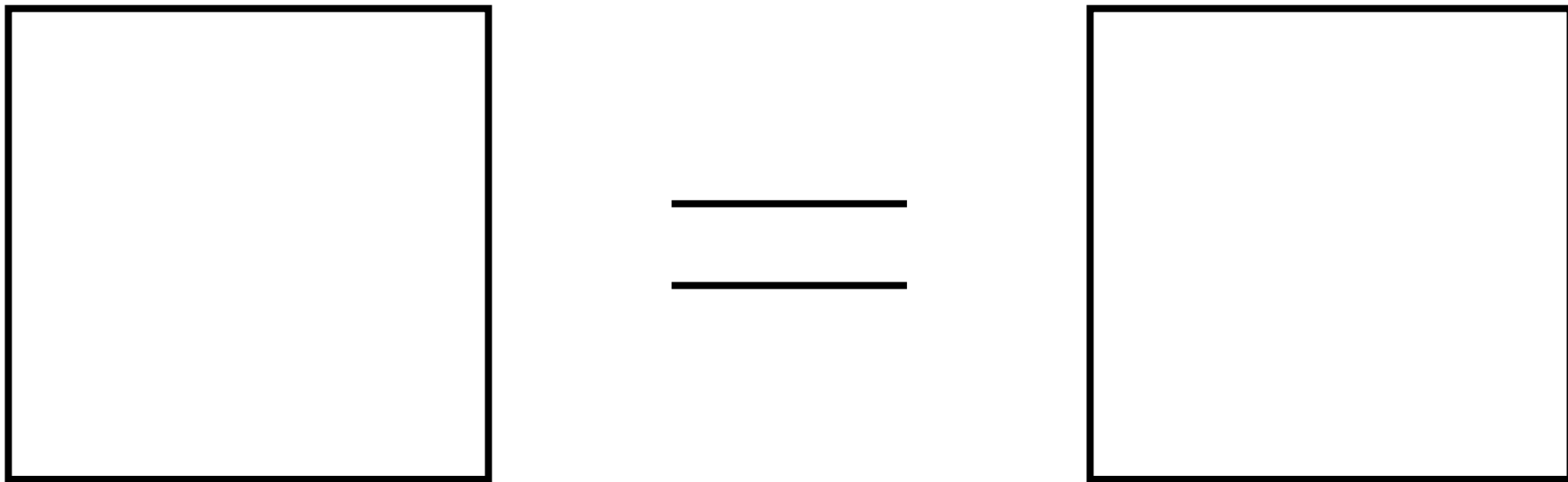
Wafer



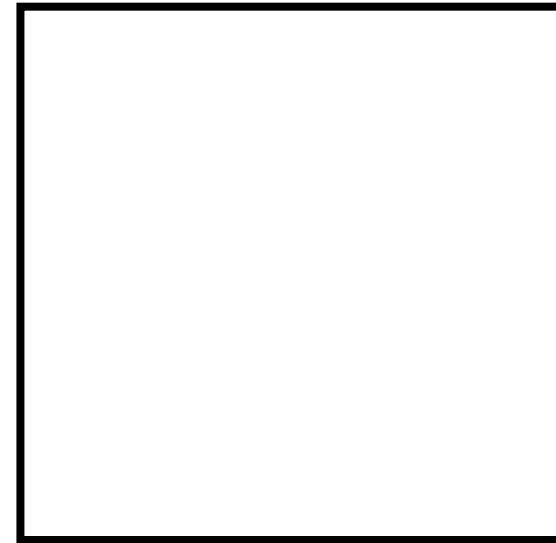
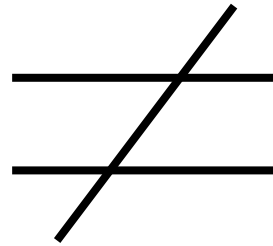
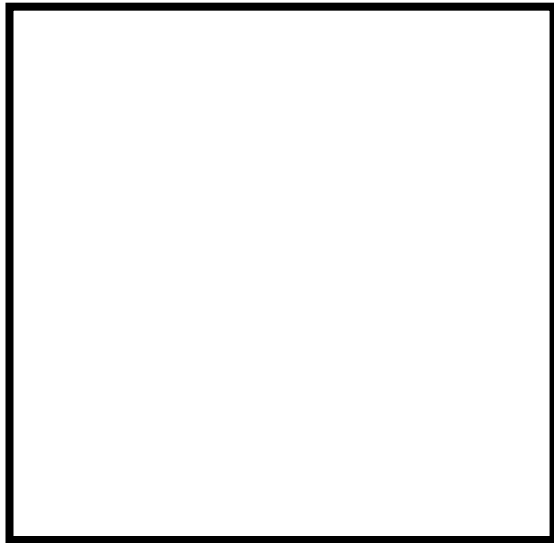
Die



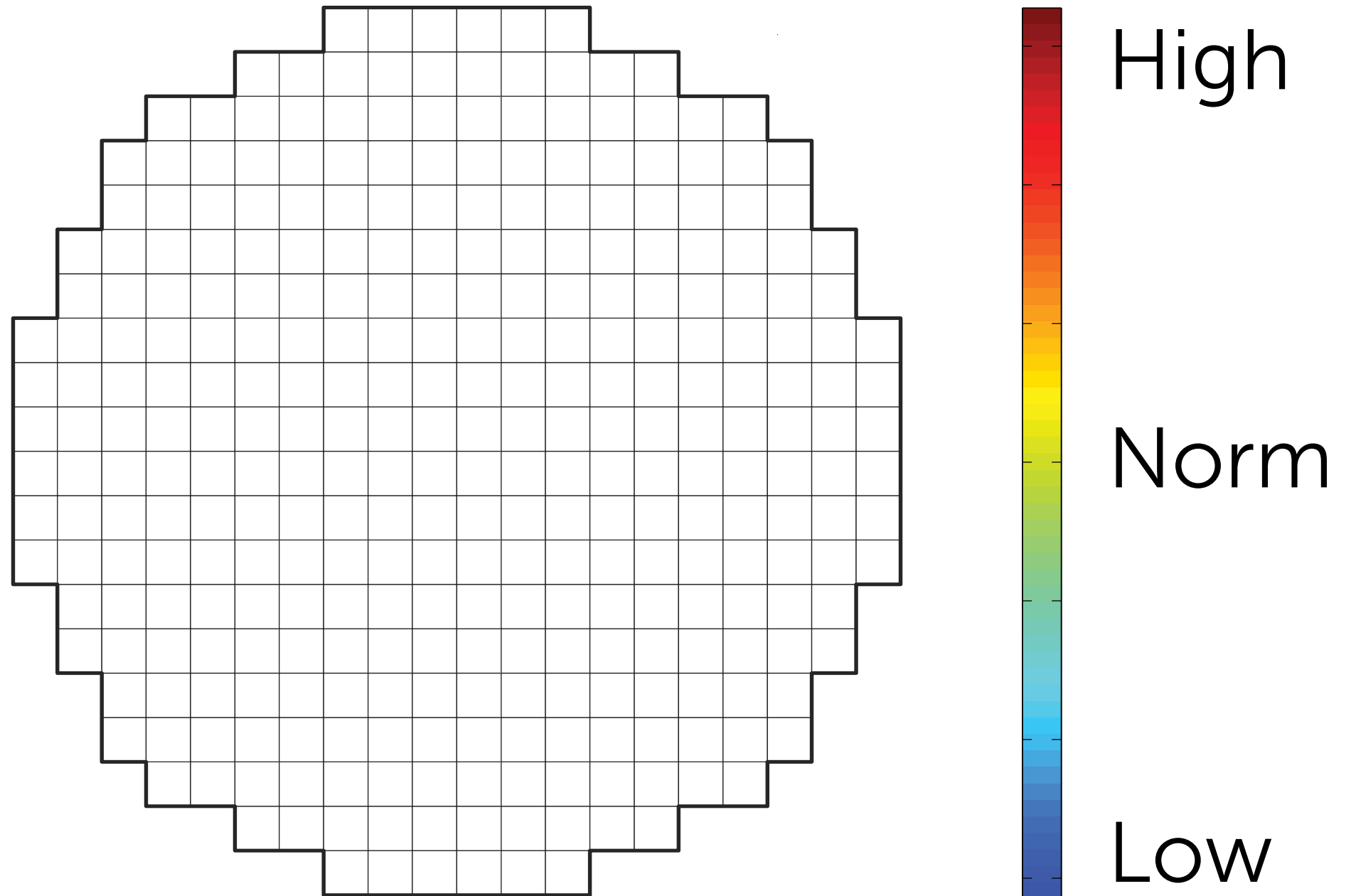
Process Variation



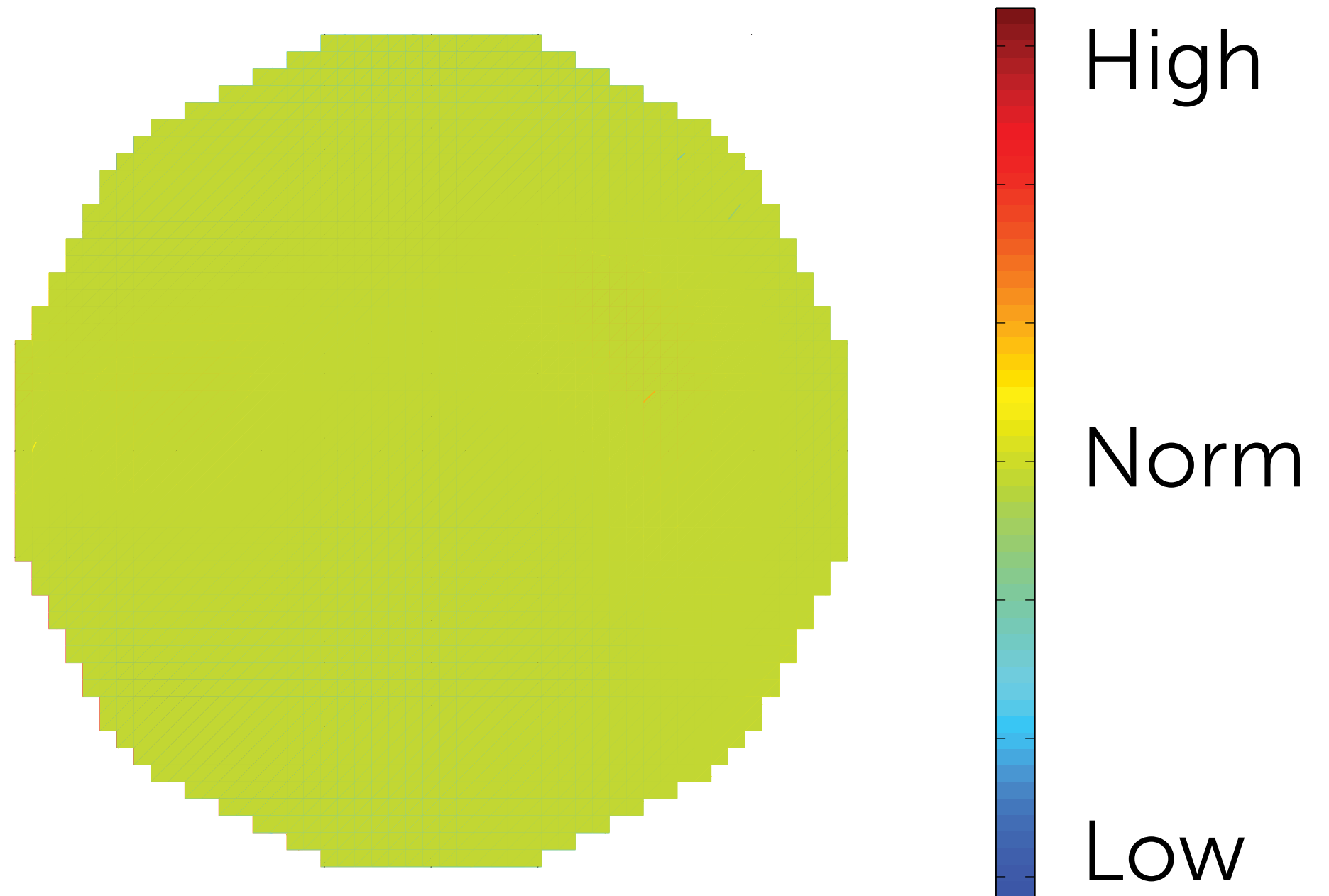
Process Variation



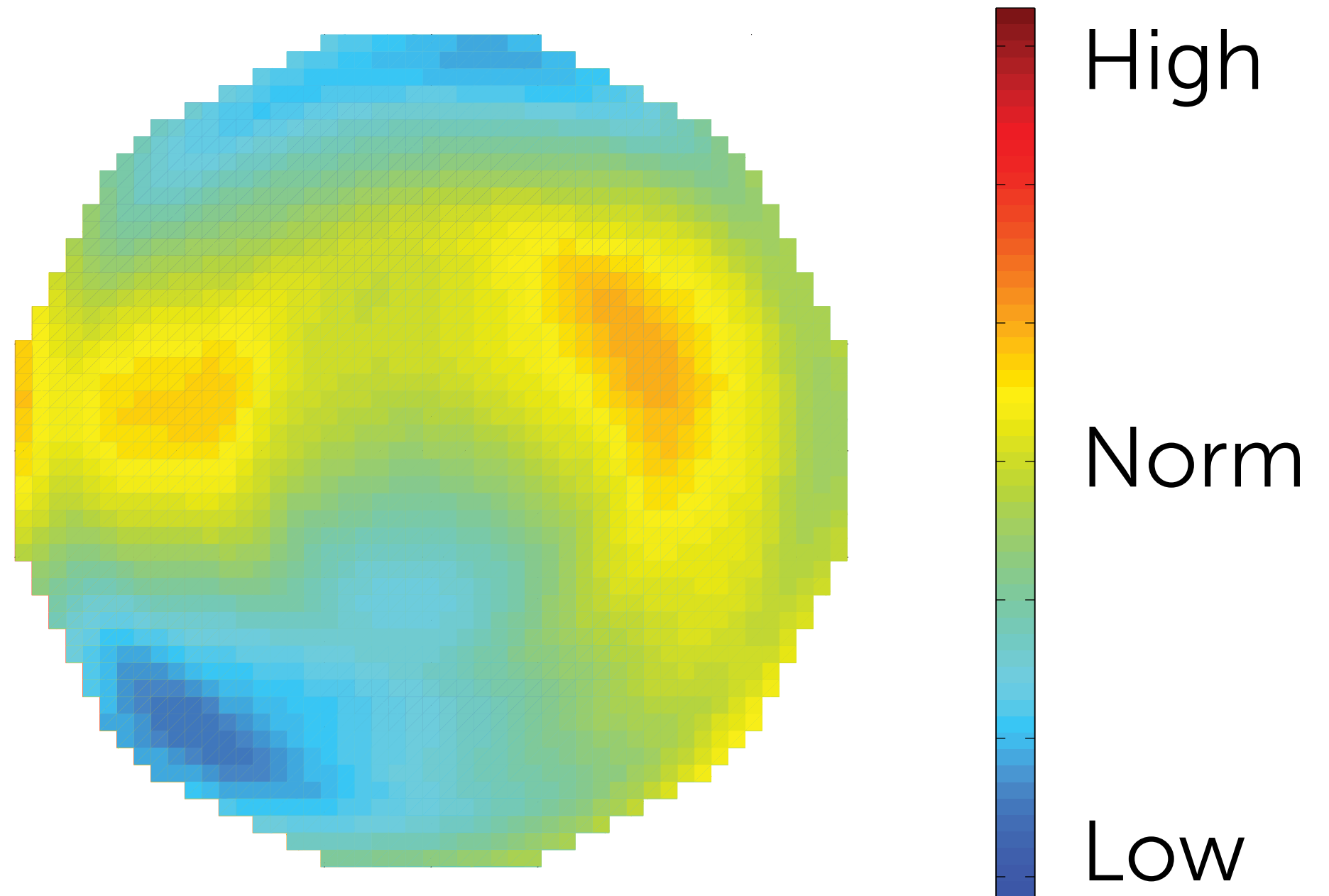
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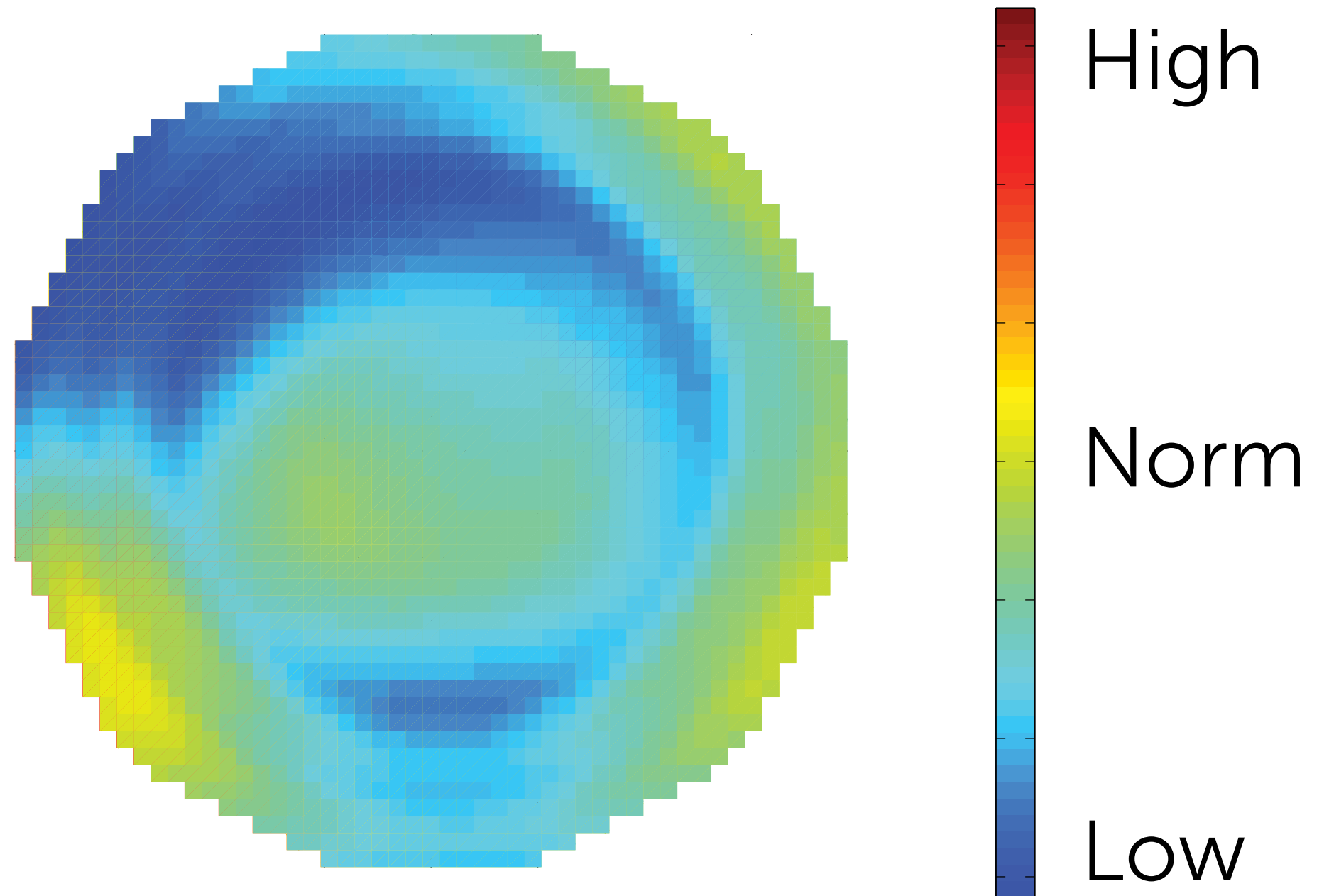
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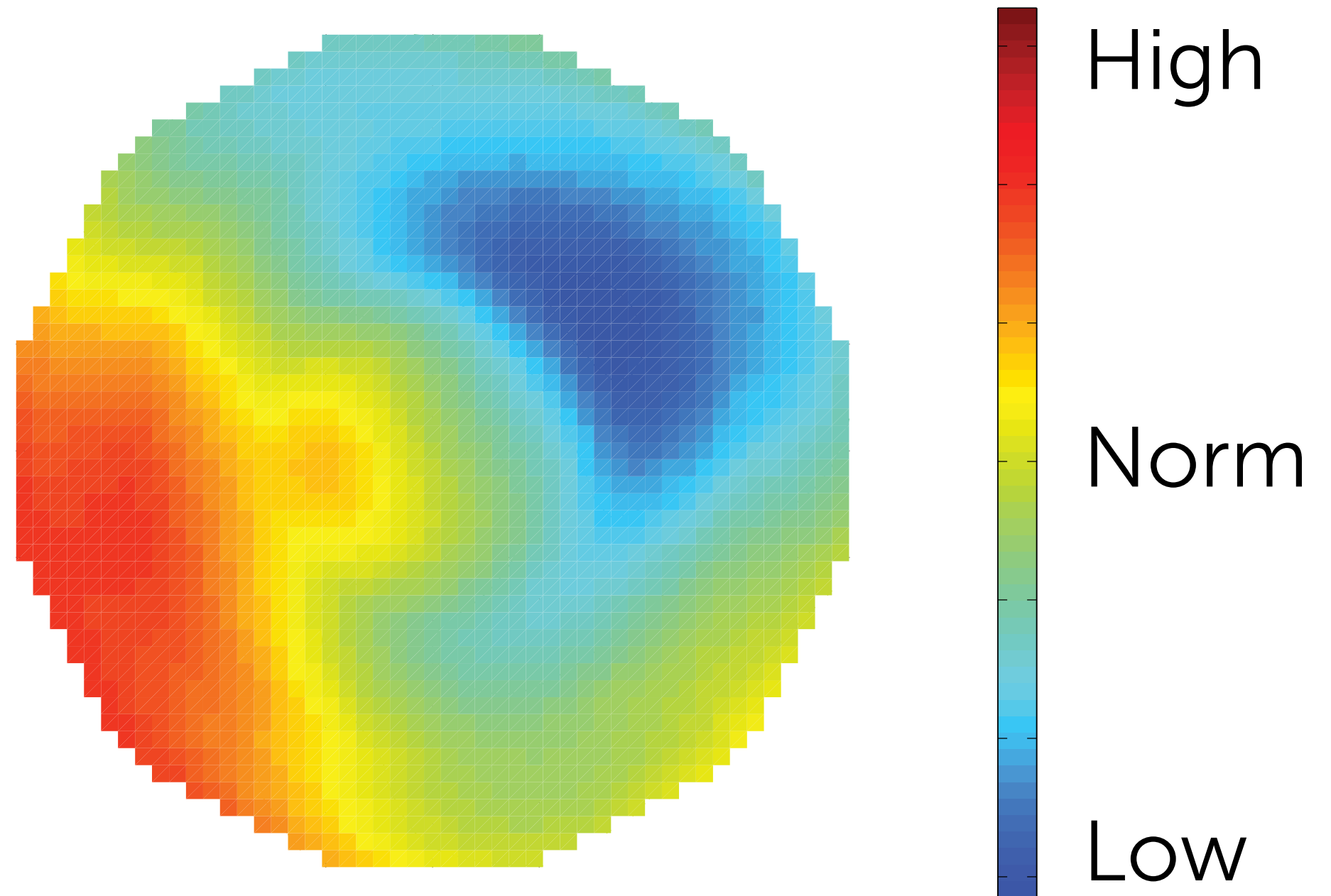
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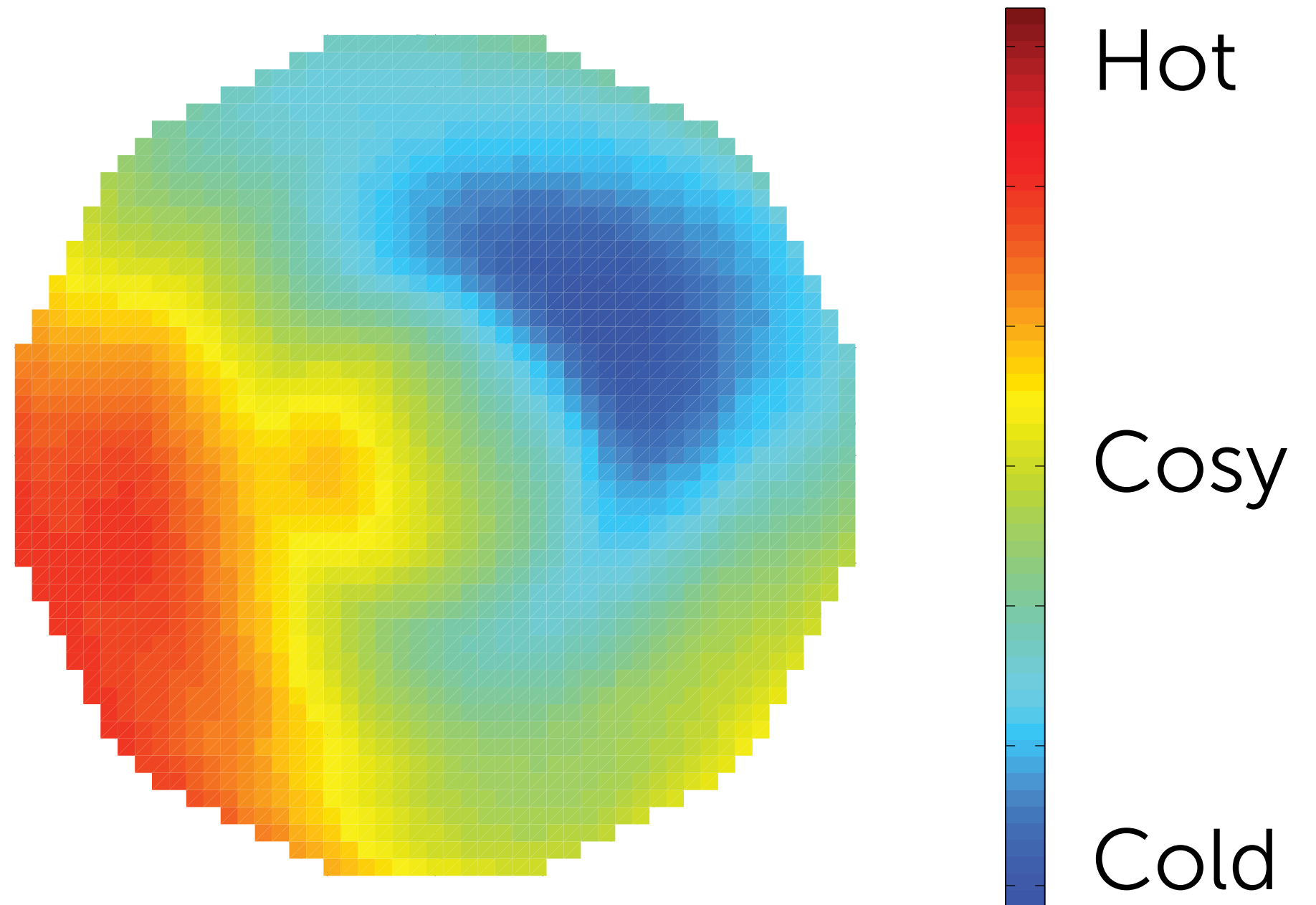
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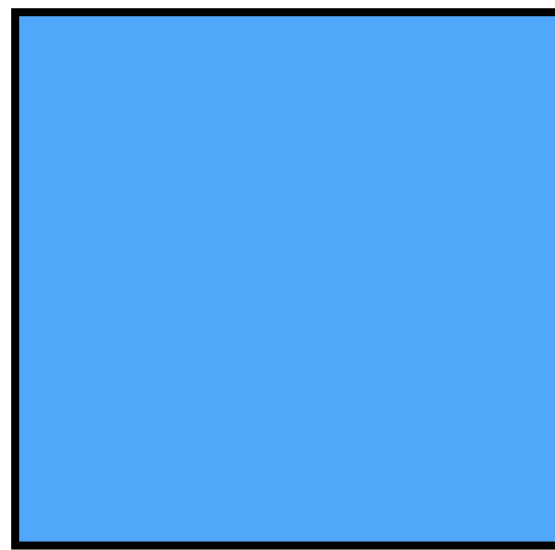
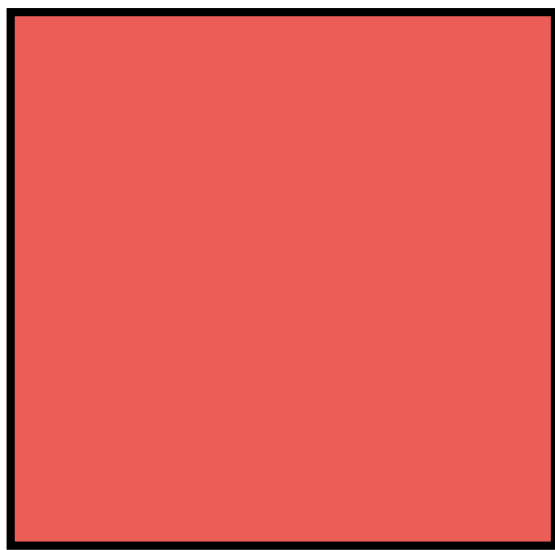
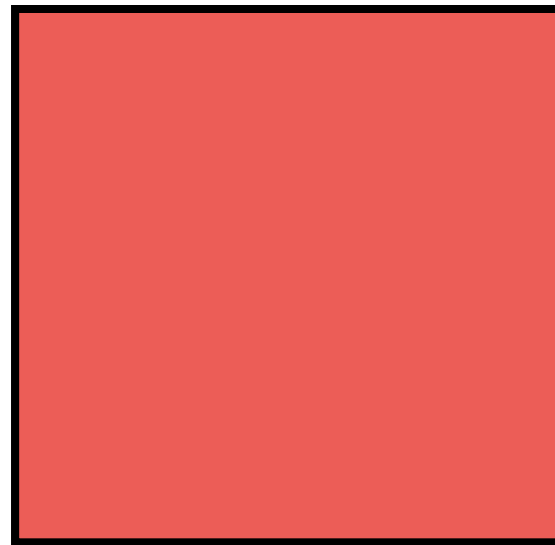
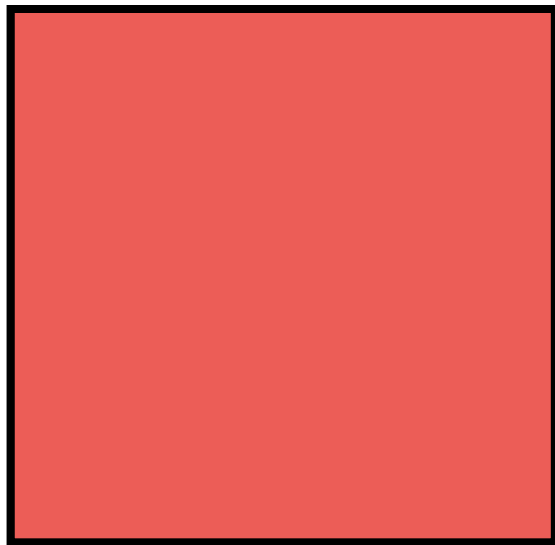
Process Variation



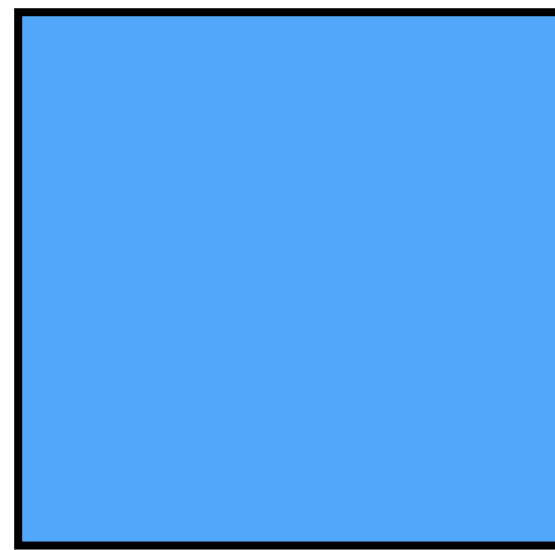
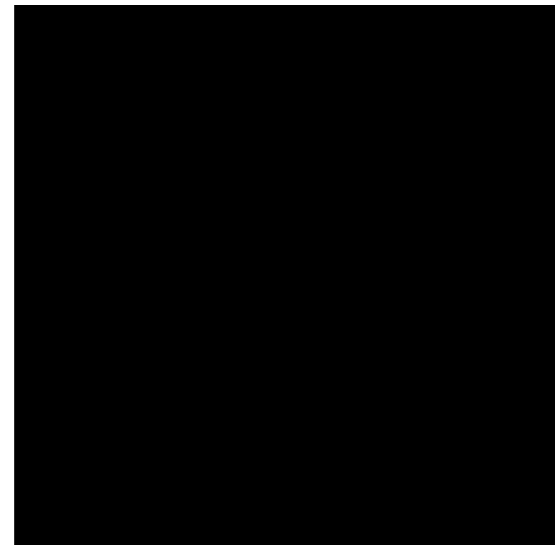
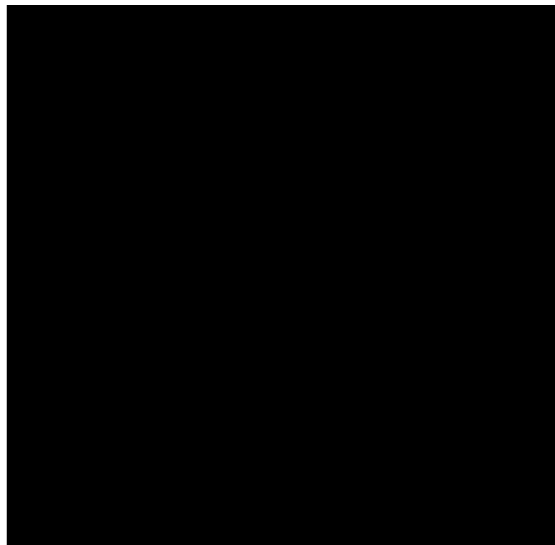
Temperature



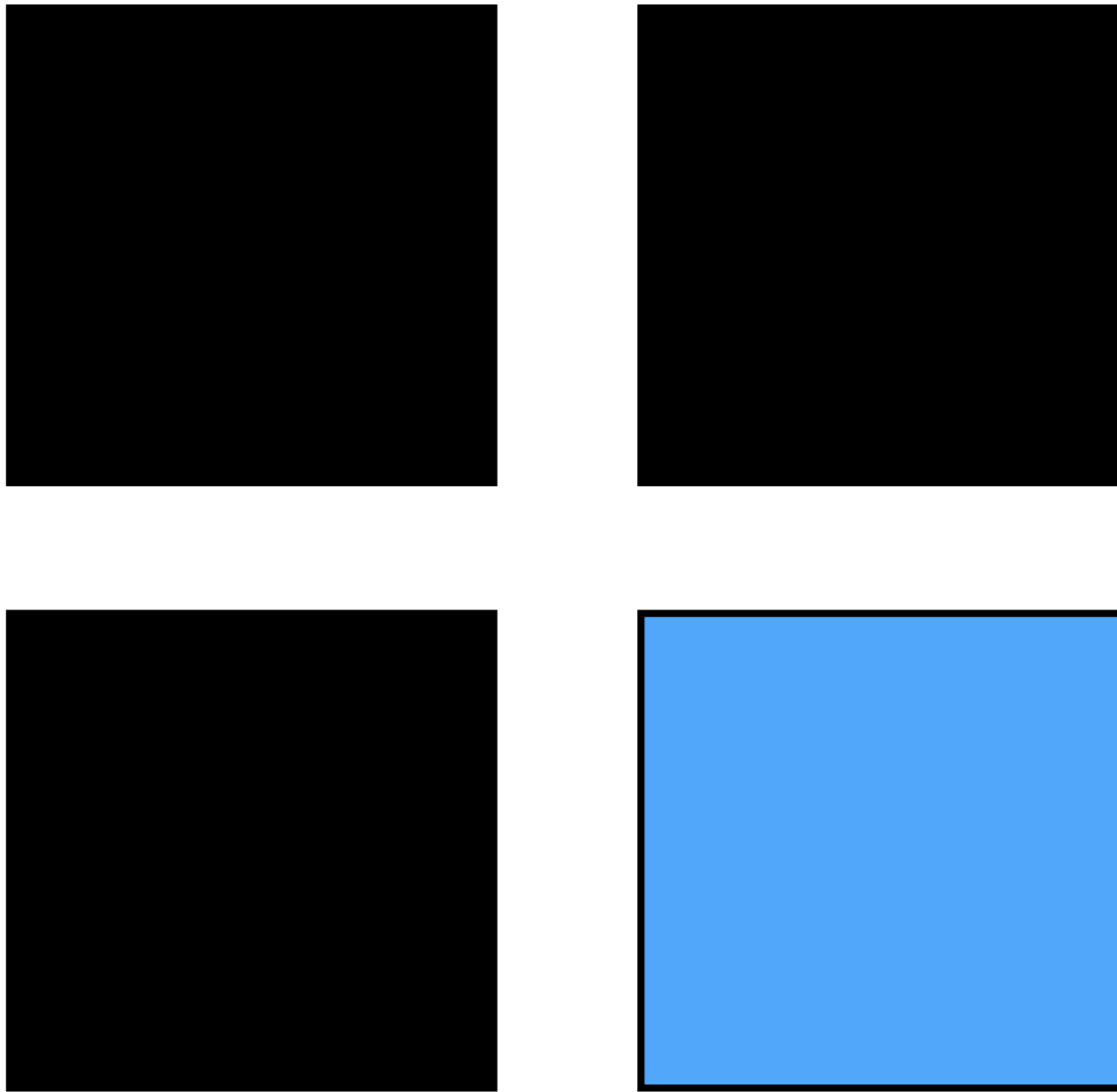
Temperature



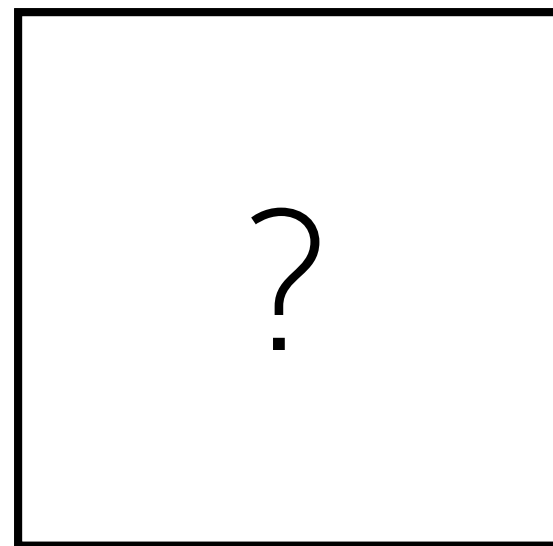
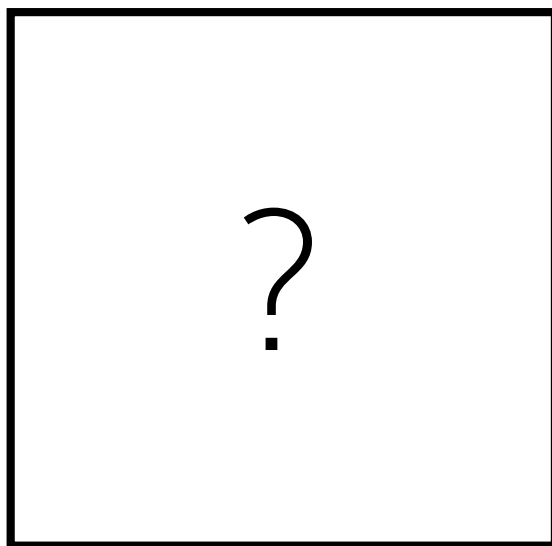
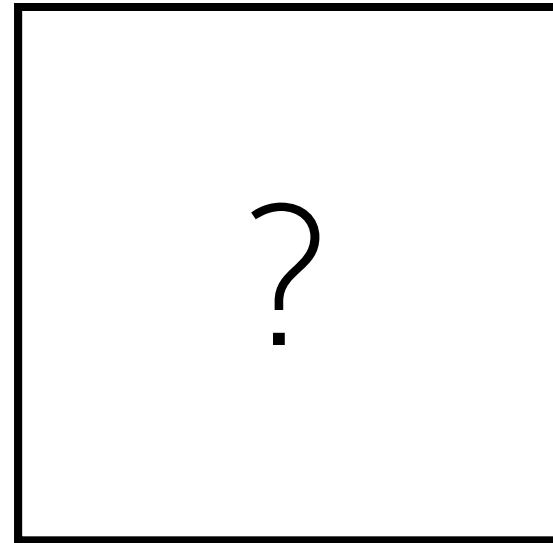
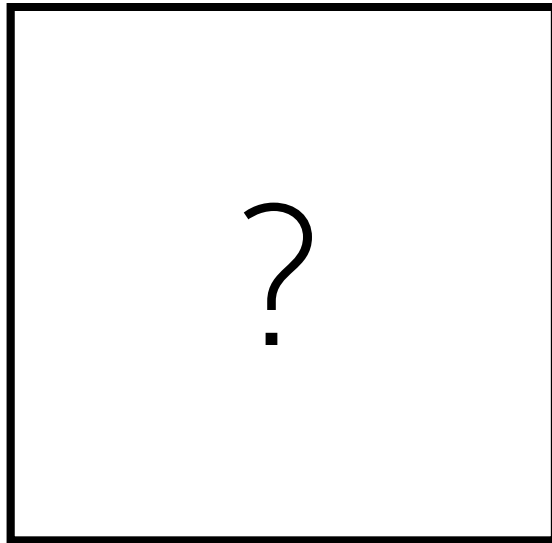
Temperature



Uncertainty



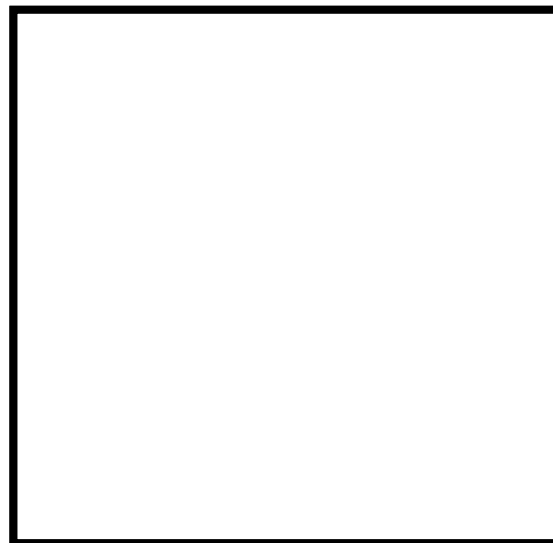
Uncertainty



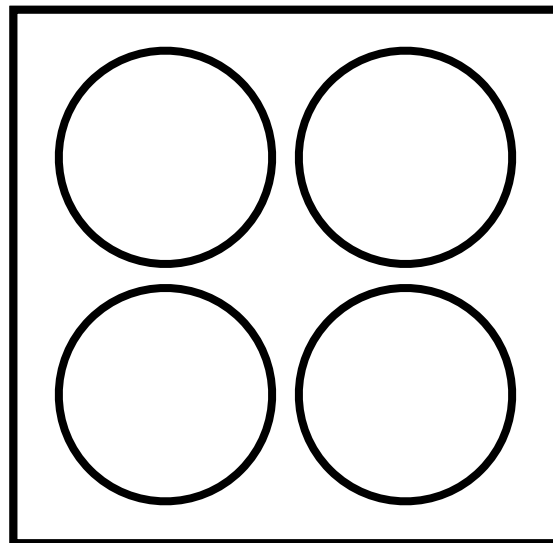
Our Work

- Accurate and efficient characterization of uncertainty

Electronic System

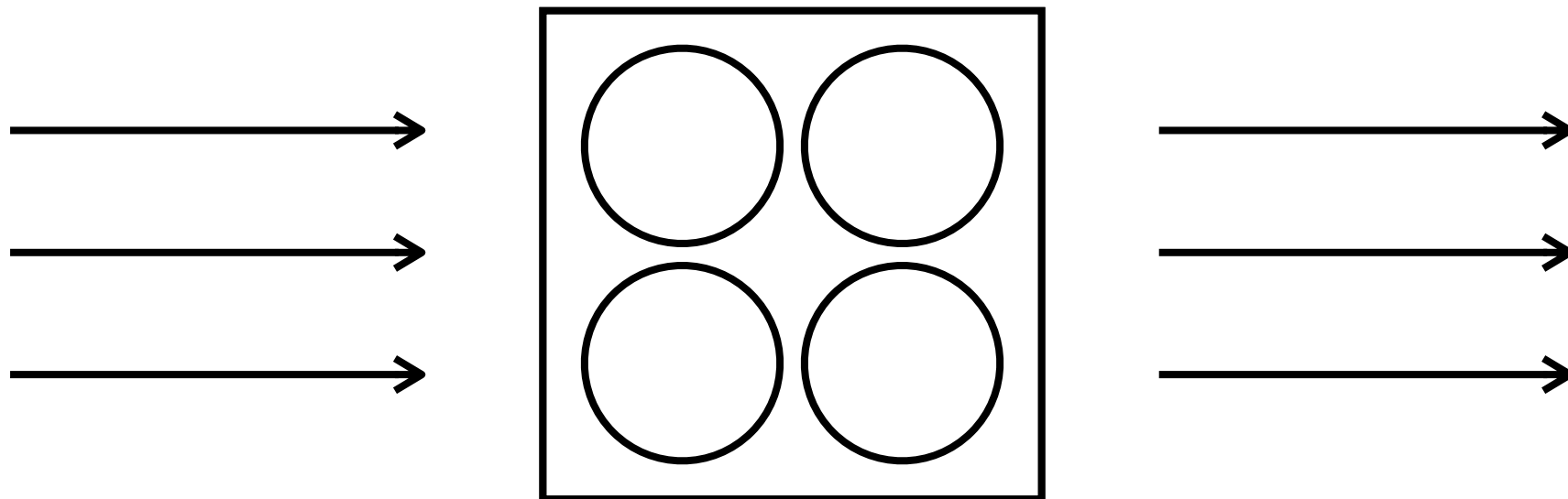


Electronic System

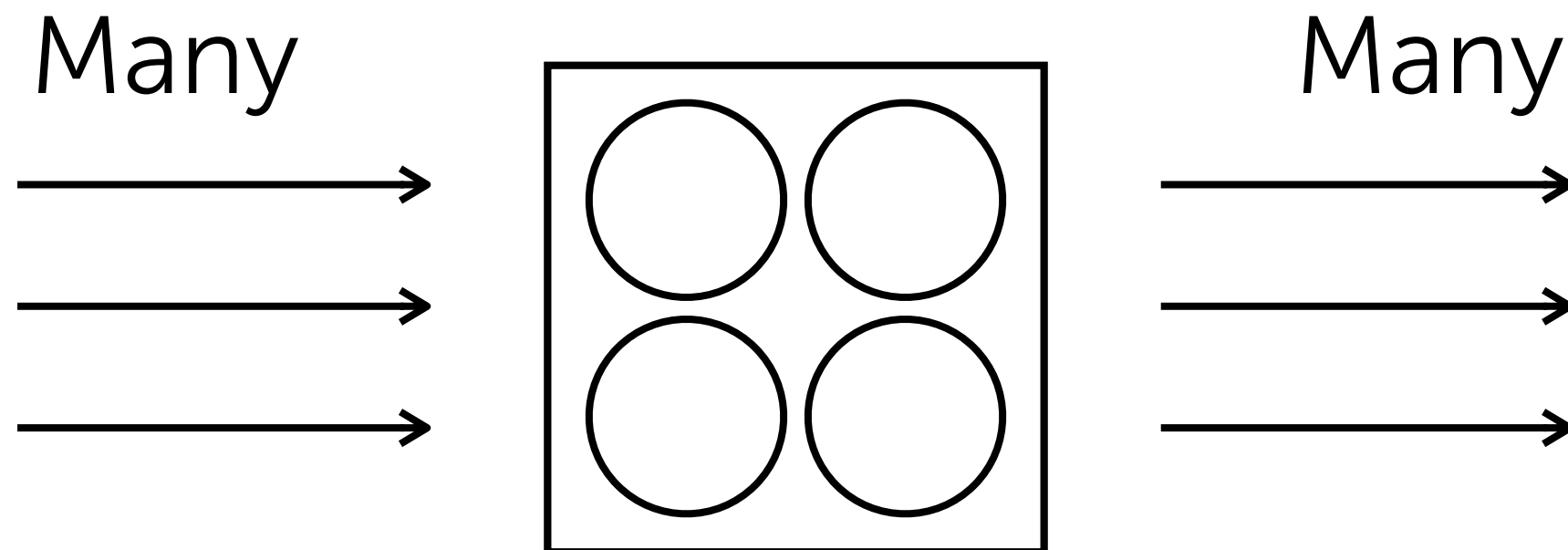


Electronic System

Deterministic

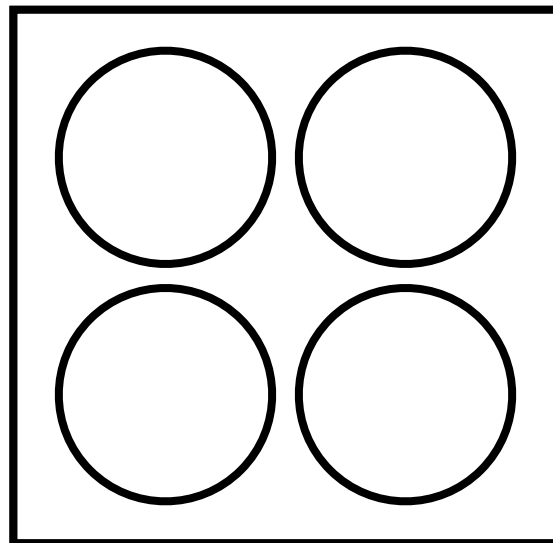
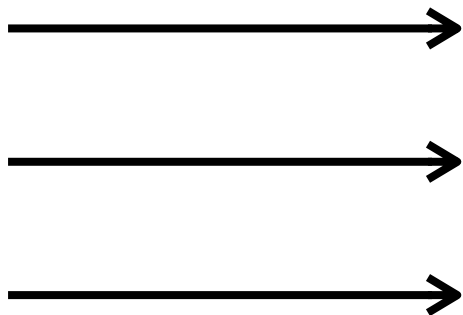


Monte Carlo

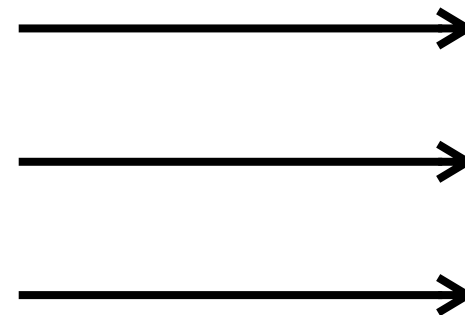


Our Work

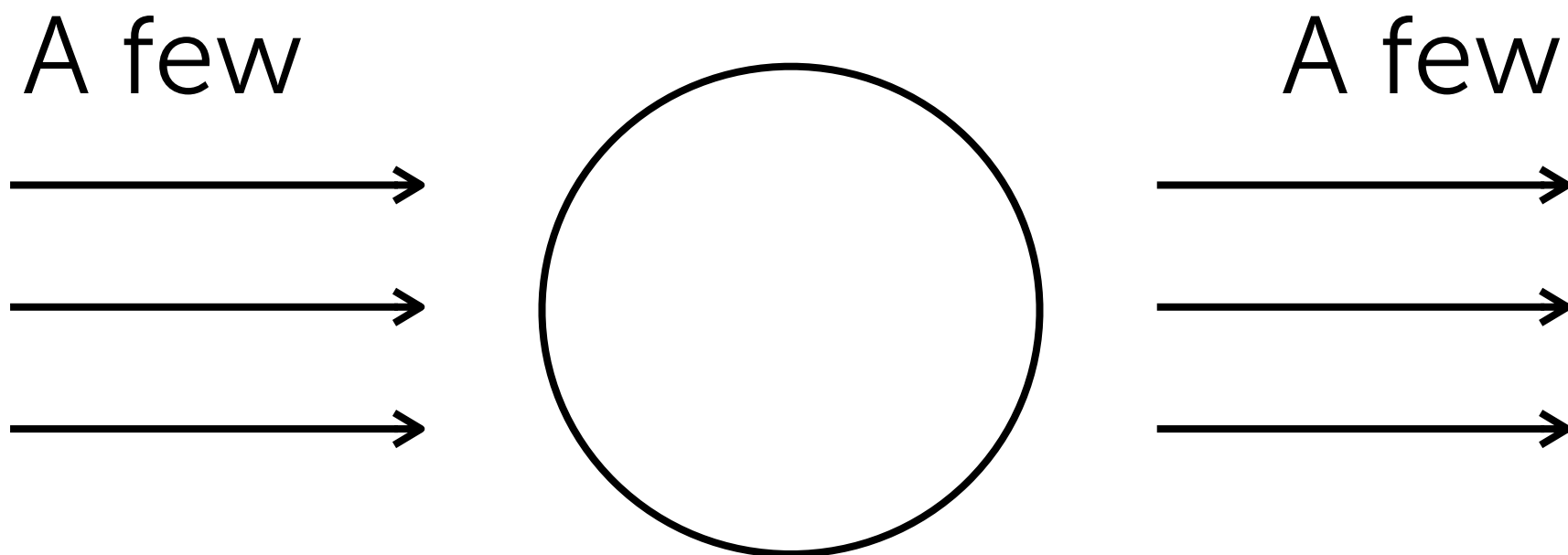
A few



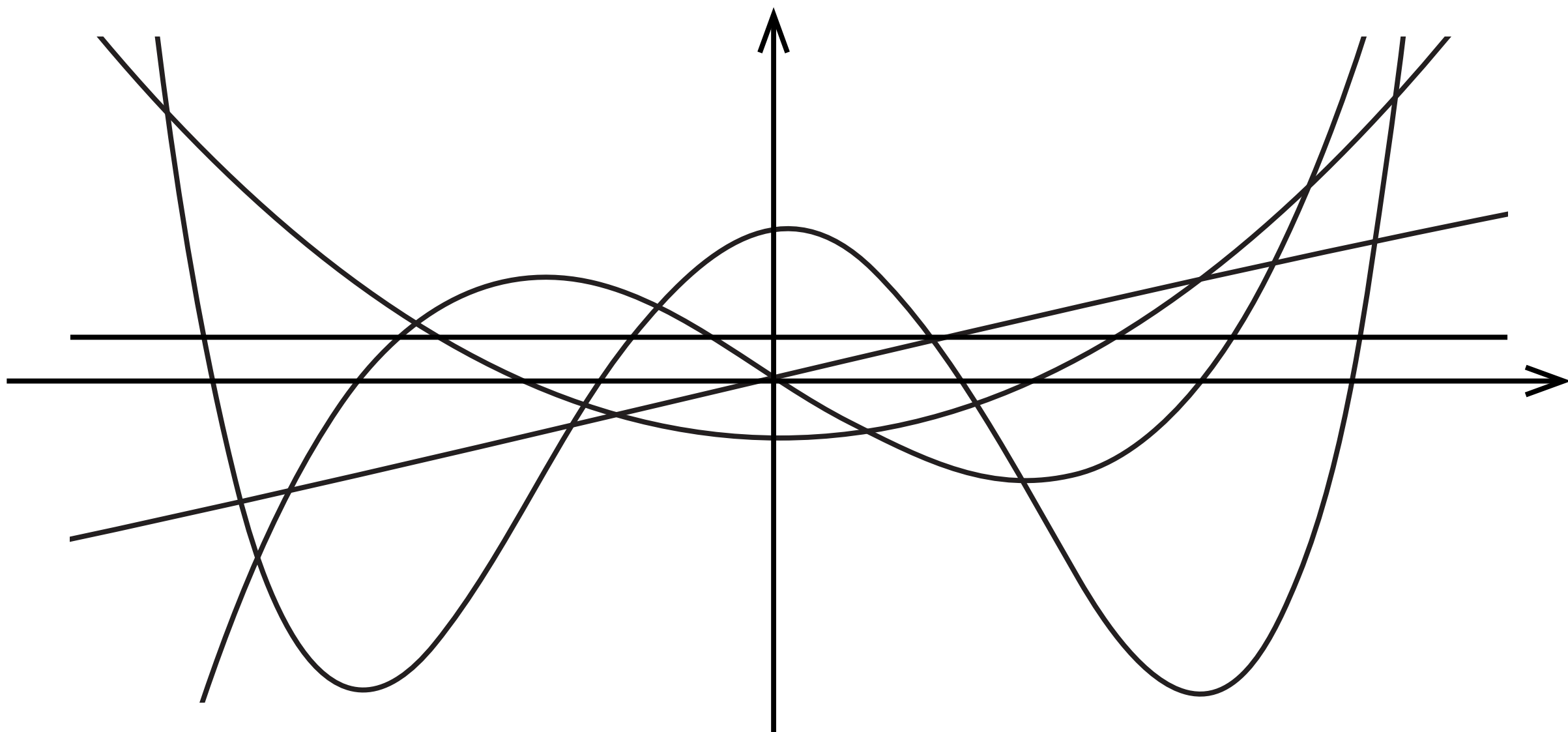
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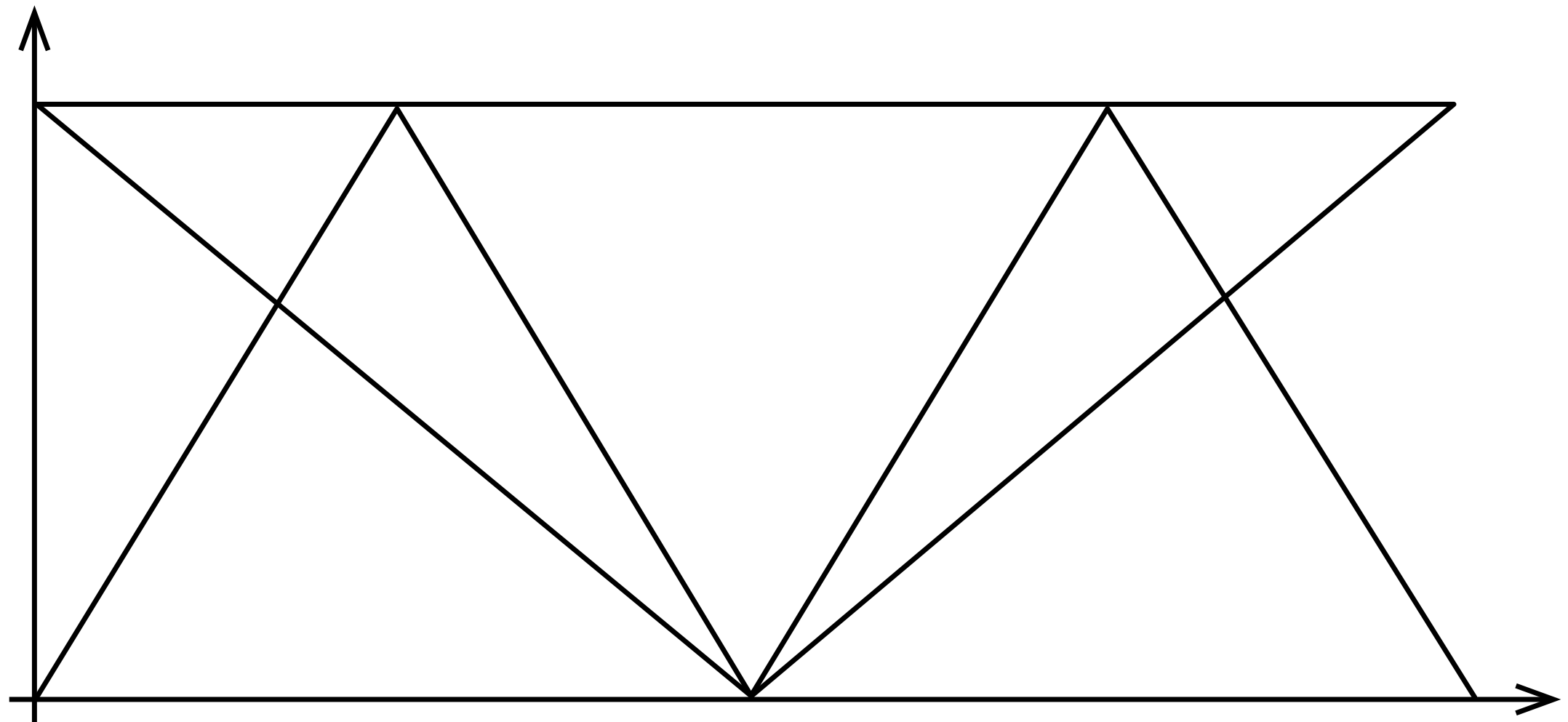
Our Work



Polynomial Chaos



Adaptive Interpolation



Thank you!
Questions?

<https://www.ida.liu.se/~ivauk83>