Simulation of the multi-view imaging system with differentiable ray tracing

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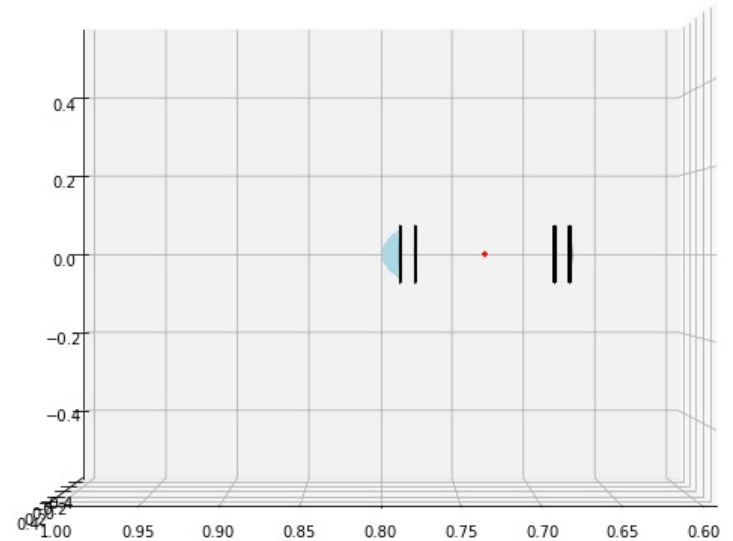
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SLAC NATIONAL ACCELERATOR LABORATORY

Stanford atom prototype

- Window 5.6cm from chamber center.
- 13.7 cm diameter window aperture.
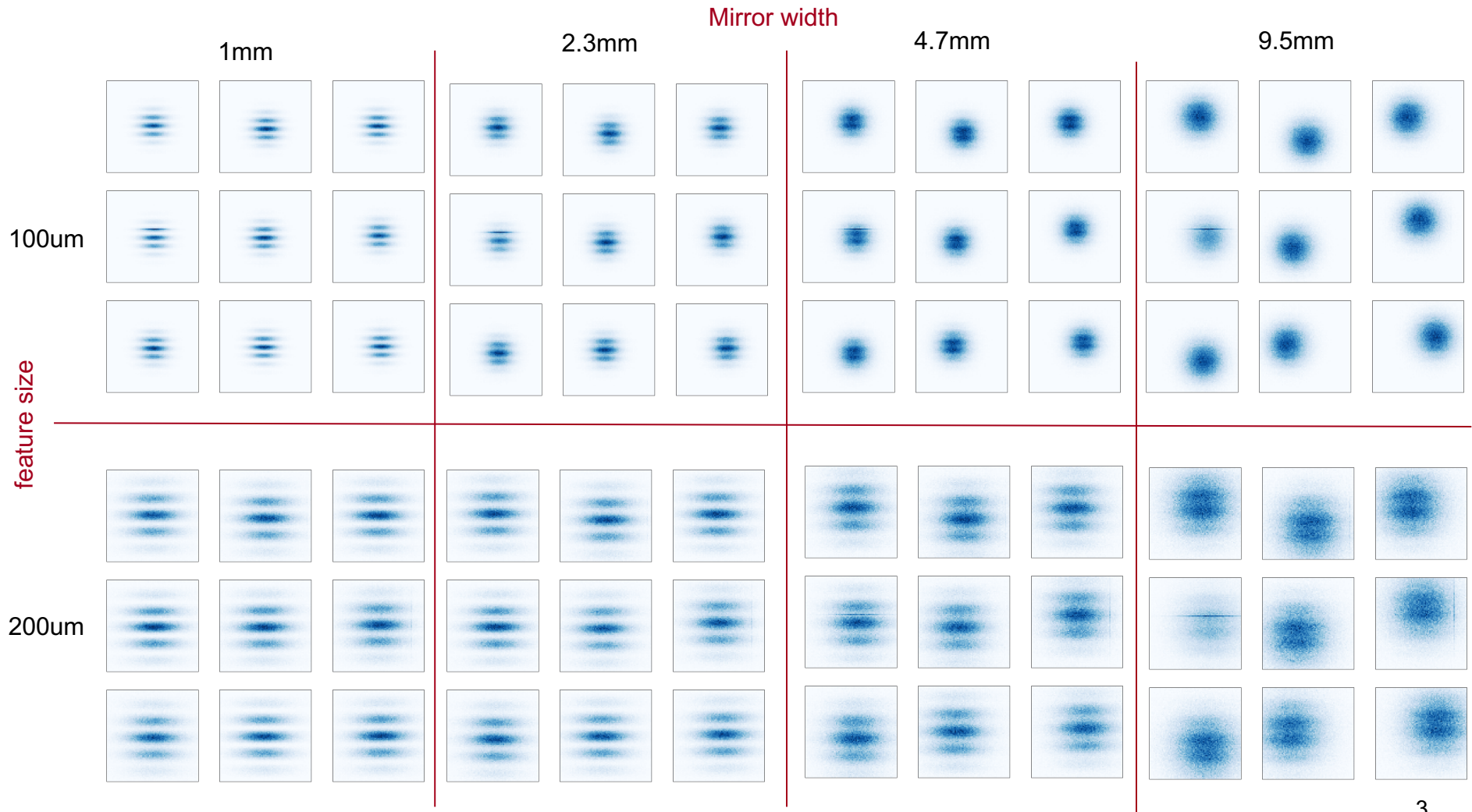- 0.95 cm Window width.

- Simulated using Snell's law.
  - Over/under optimistic?

- 7056 glass is pretty common in vacuum windows.
  - Refractive Index of 1.487 @589.3nm.
  - 1.49300 @480.0nm.
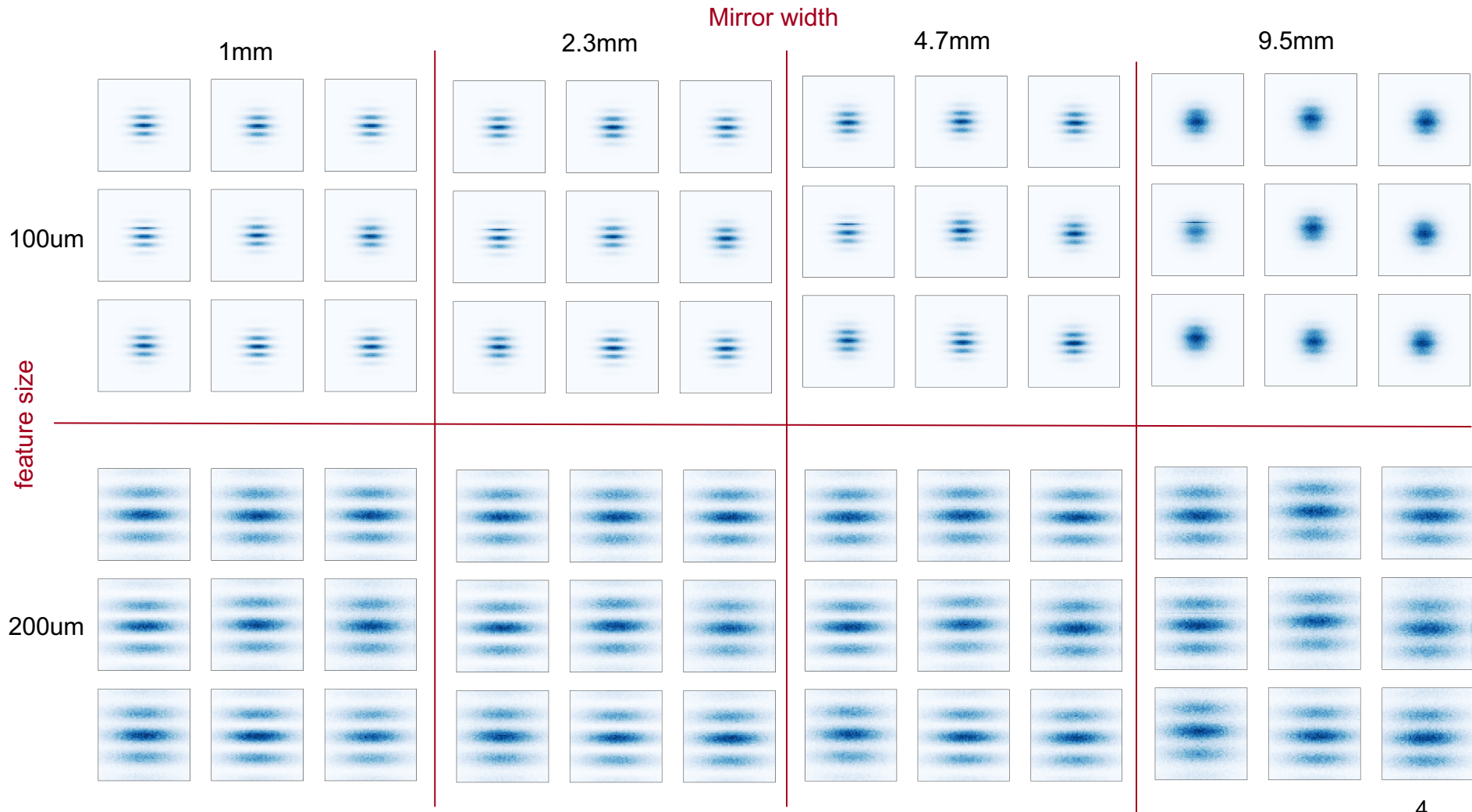 - Using 1.494 @ 461.0nm.

Simulation results

- F=55 mm, m=0.109, pixel size = 2.74 um.

Simulation results (only one window – between the lens and the cloud)

- F=55 mm, m=0.109, pixel size = 2.74 um.

Spring research project

- An undergrad student will study the impact of the system parameters / noise.

    - Reconstruction-based metrics (ground truth against regenerated).
    - Can we define metrics at the image level?