











Outline

The pupil

- Animal kingdom
- Optics

Pupil imaging

- Optical architecture
- The Fourier domain
- Overlay metrology by pupil imaging
 - Target architecture
 - Quantification



Evolution has generated diversity in pupil structure.



The pupil means many things





Exposure vs Depth of field





















Field imaging architecture





Pupil imaging architecture





confidential

It's all about diffraction



 $dSin\theta = m\lambda$



What is overlay and why is it important?





For zero offset, first orders are rotationally symmetric.



Summary

The *pupil* has many historical meanings and uses in optics.



 The pupil is also a location in the optical path which enables the image to be viewed in the *Fourier domain*.

Overlay metrology is enabled by pupil imaging of overlaid periodic structures.



- $\begin{array}{c} \bullet & I_+ \\ \bullet & I_0 \\ \bullet & I \end{array}$
- Translational offsets between periodic structures are required in order to quantify symmetry breaking in the pupil image.



Thank You

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