ZTF QA meeting, 26 February 2021

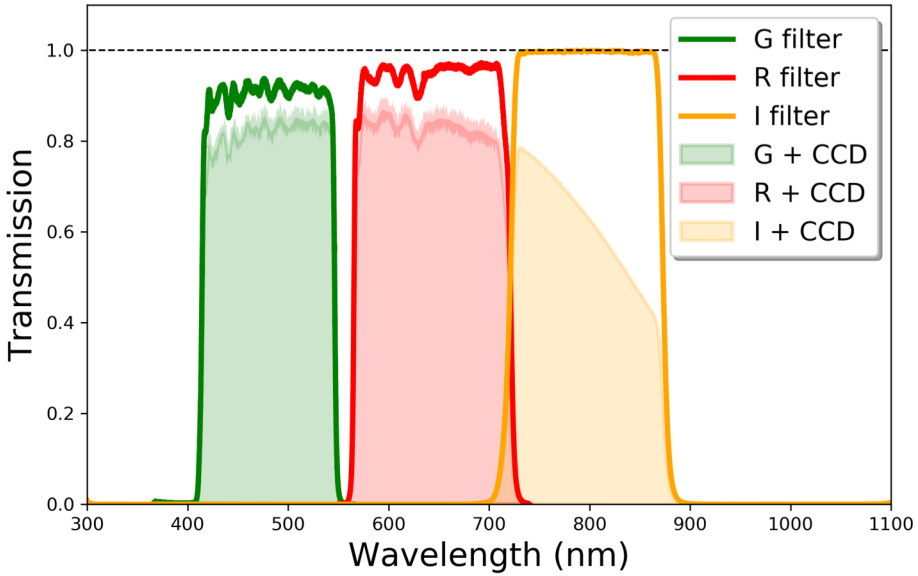
CCD thickness investigation (4^{th} episode)

Philippe Rosnet
Laboratoire de Physique de Clermont
Université Clermont Auvergne – CNRS/IN2P3

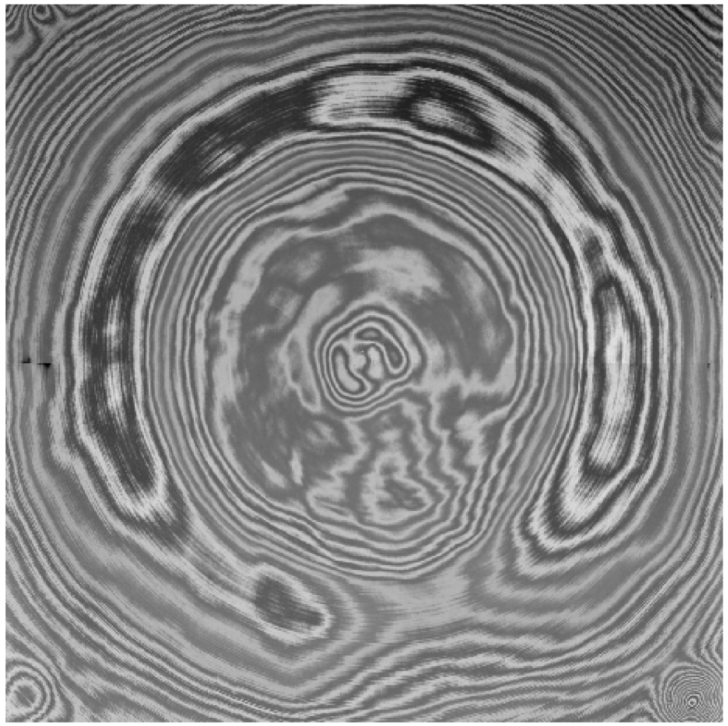
with

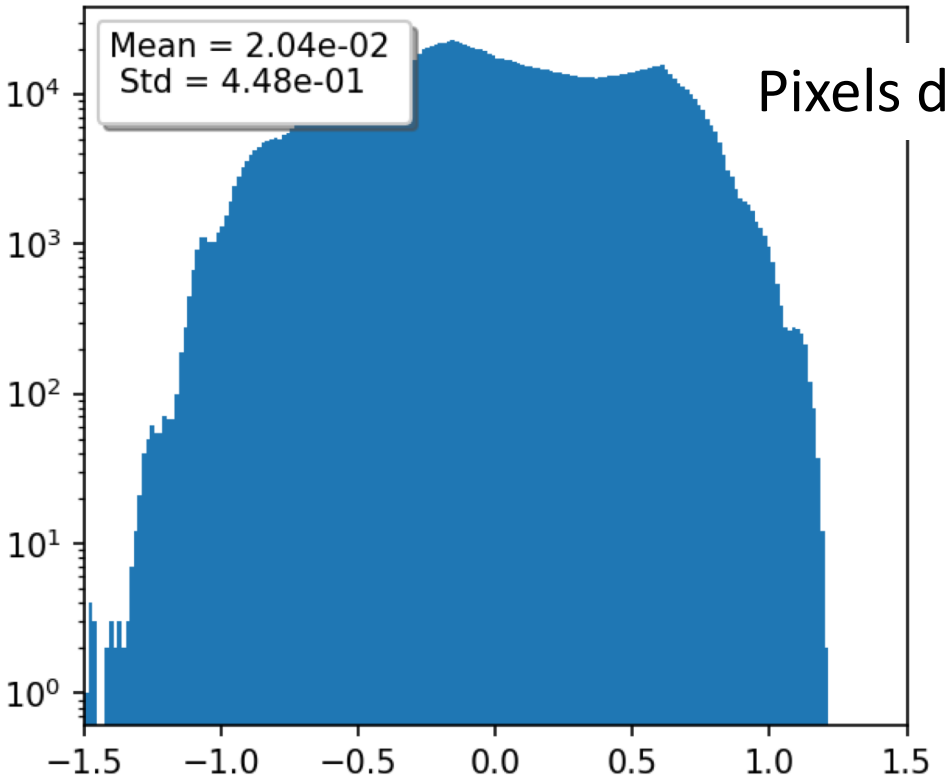
Roger Smith, Steve Kaye, Michael Coughlin and Michael Medford

Initial idea: use CCD fringing pattern from PCA analysis of I-band images (M. Medford) to deduce CCD thickness profile



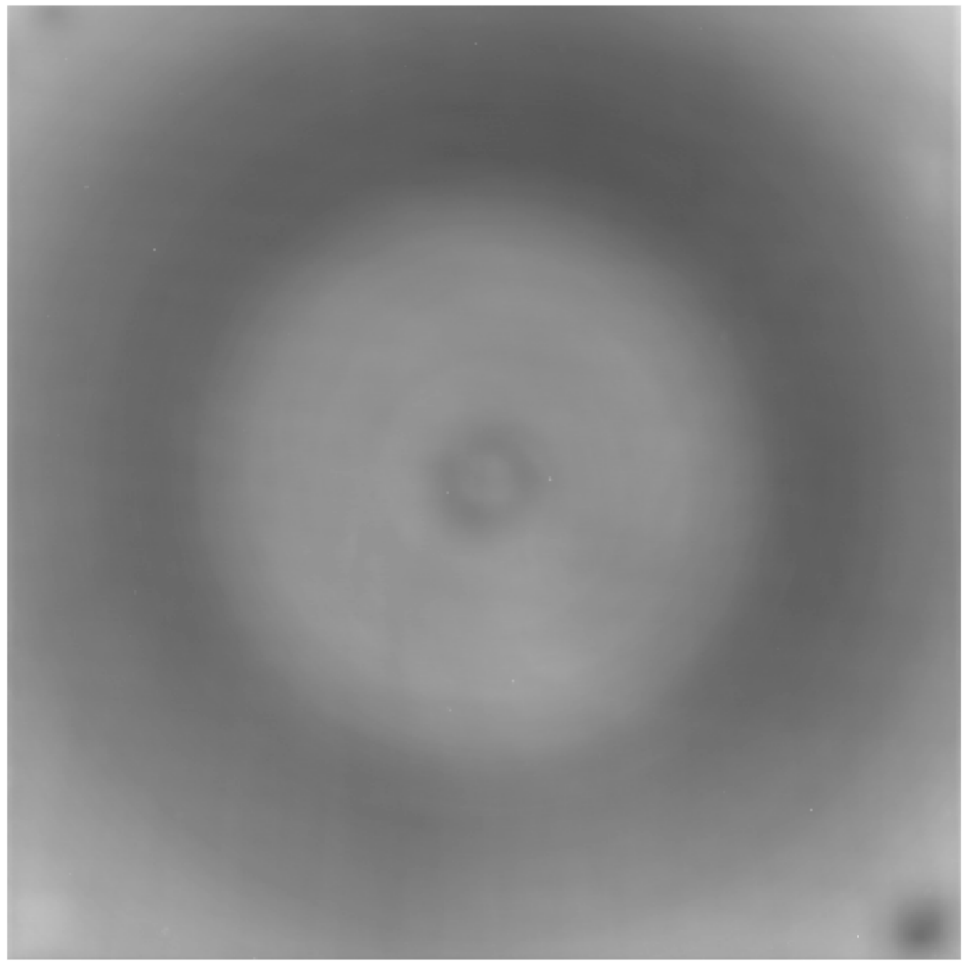
CCD 01 fringing map

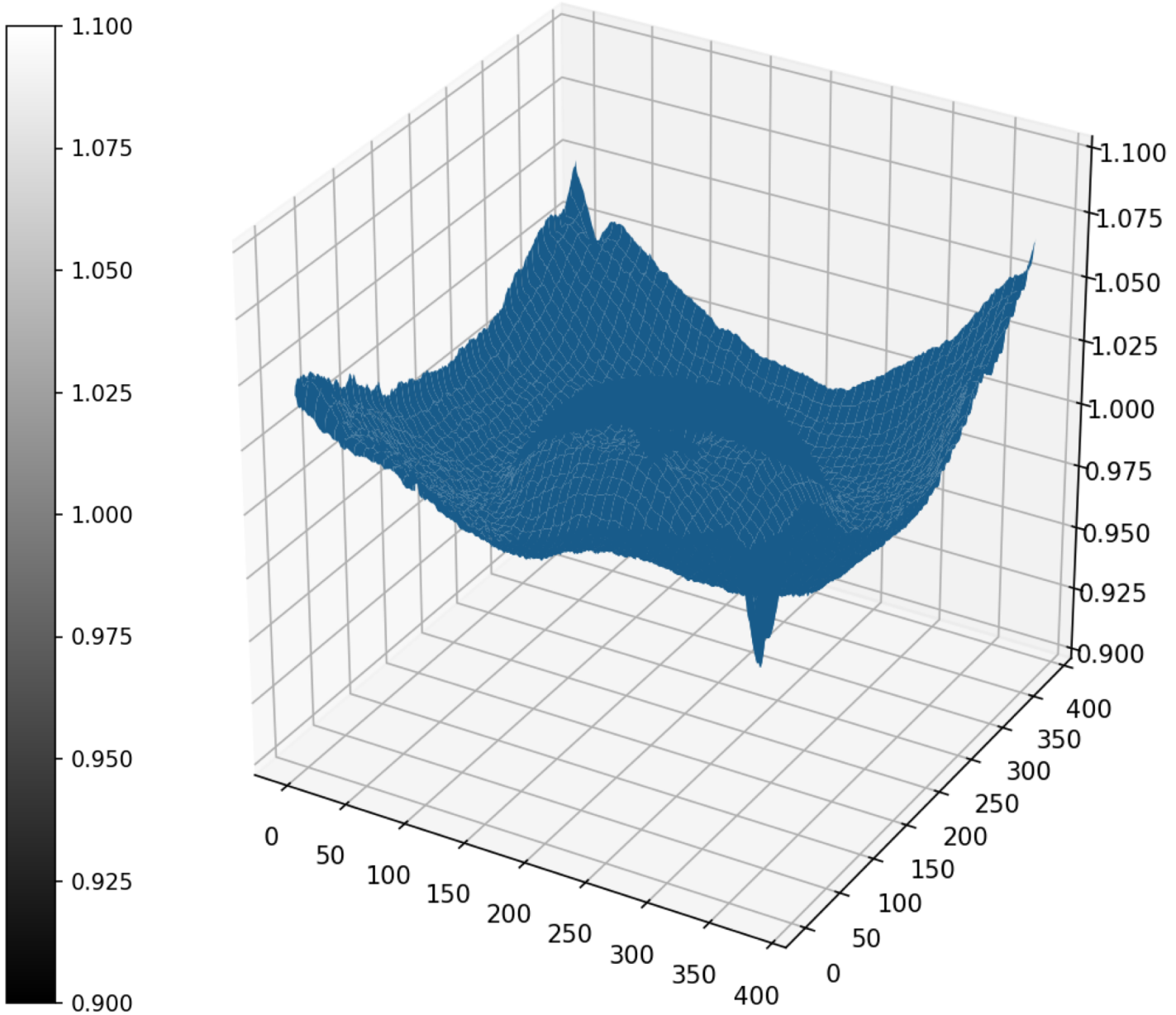




Pixels distribution

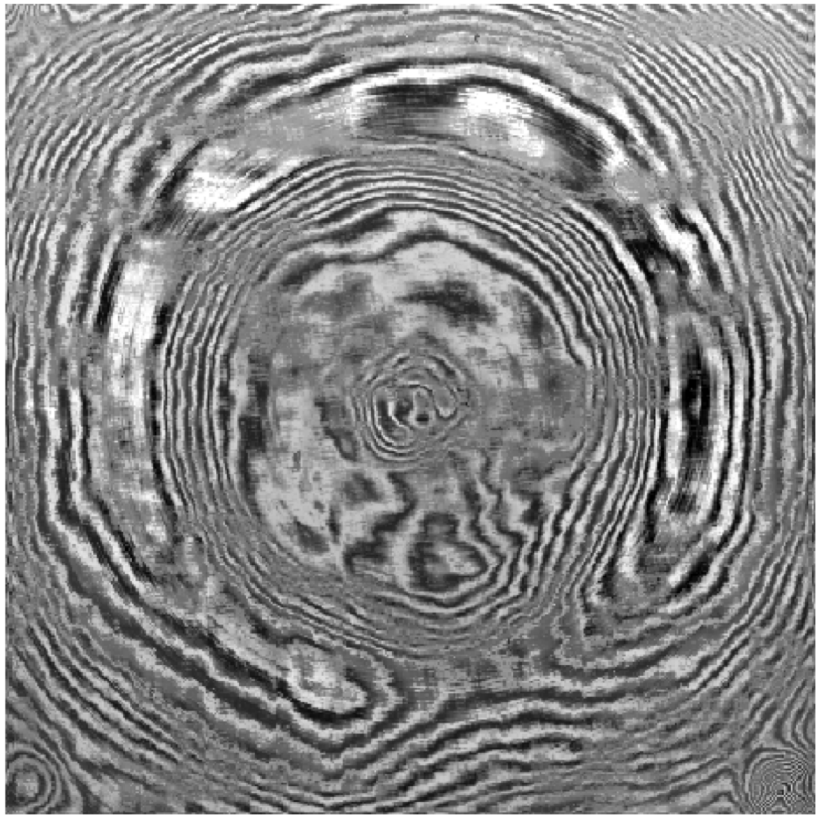
LED ratio filterless: CCD 01

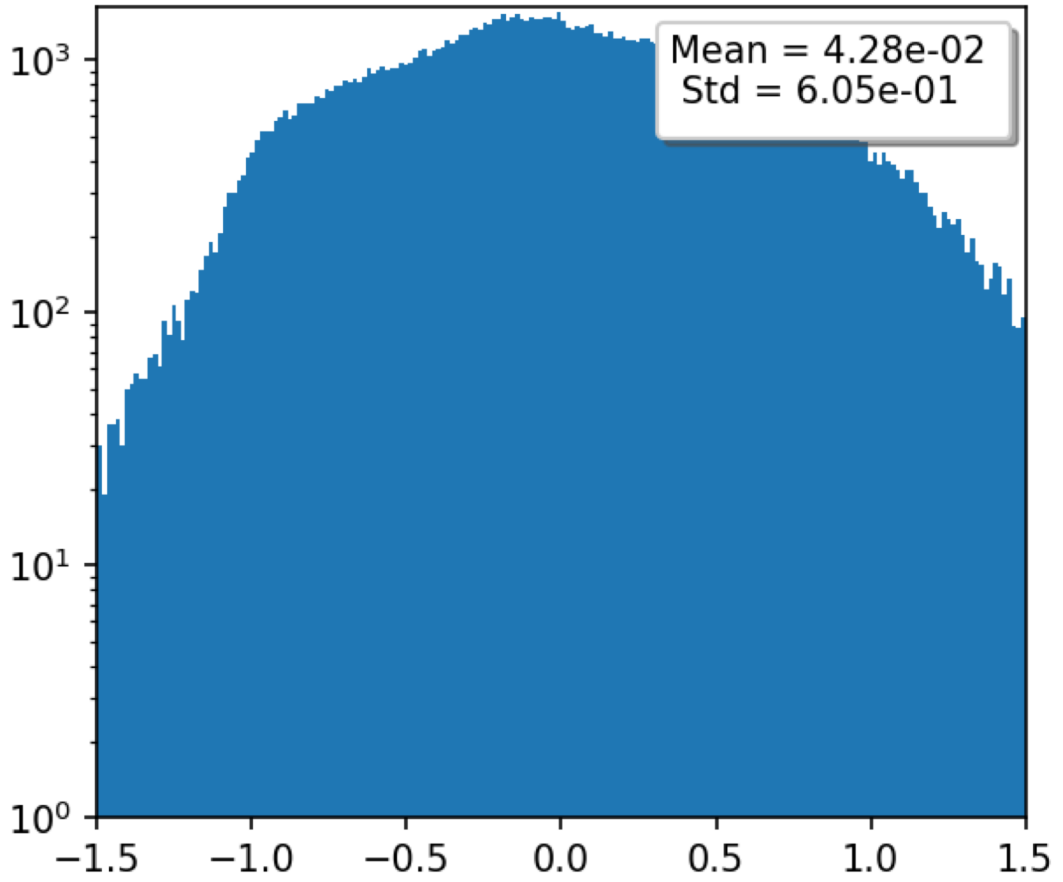




Fitting of overall thickness

- Minimization procedure (iminuit) of the standard deviation (std) of the pixel distribution of the difference between model and observed fringing maps
- Two free parameters fit
    - $d = 24.99\ \mu\text{m}$
    - $r = 0.4996$

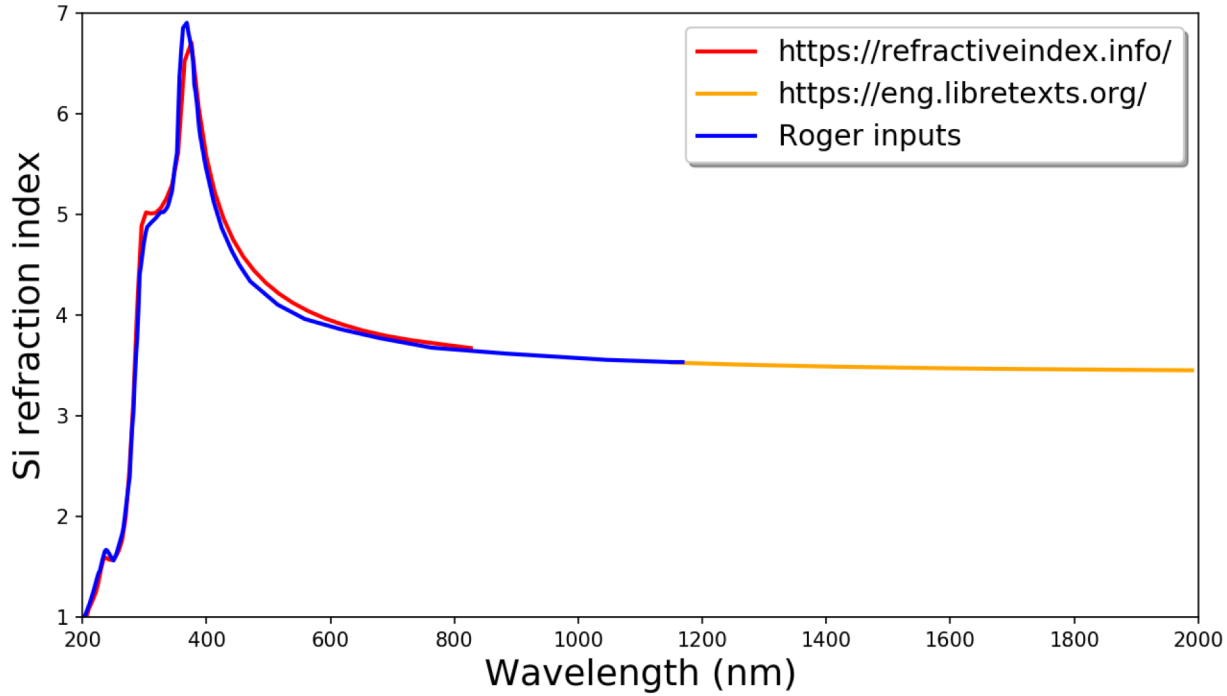


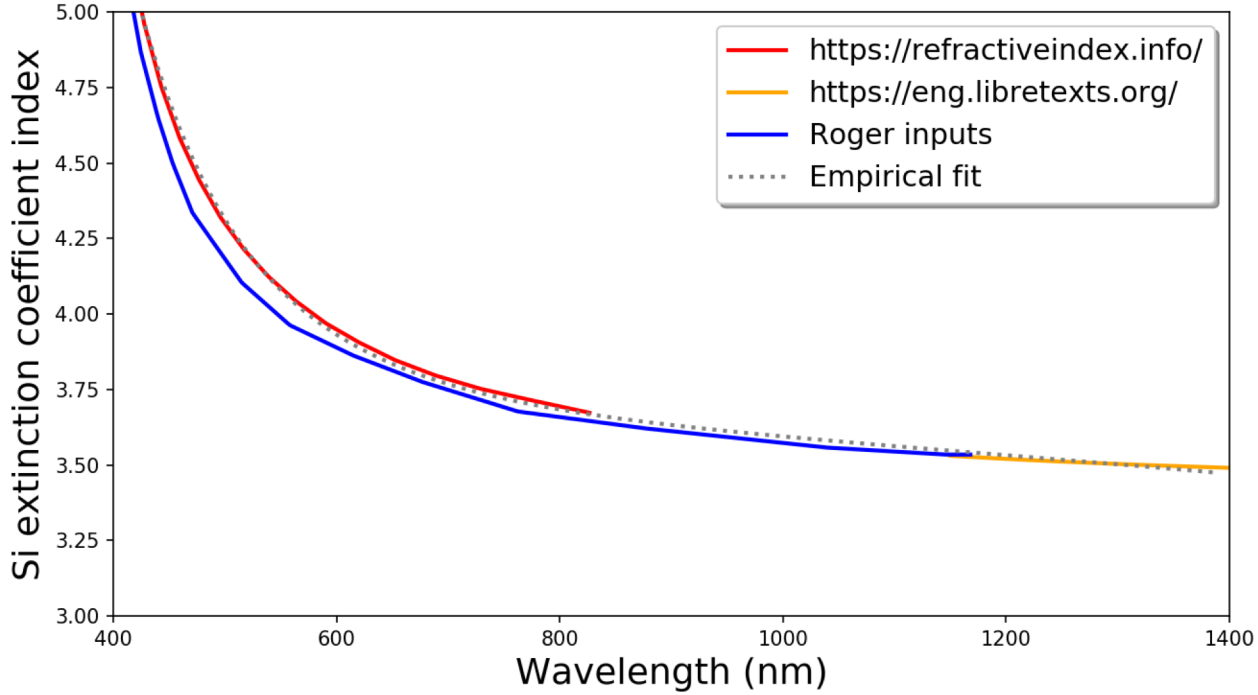


Silicon refraction index

$$I = I_0 \frac{(1-r)^2}{1 + r^2 - 2r\cos\Delta\phi}$$

$$\Delta\phi = 2\frac{2\pi}{\lambda} n_{\mathrm{Si}} d\cos\beta$$

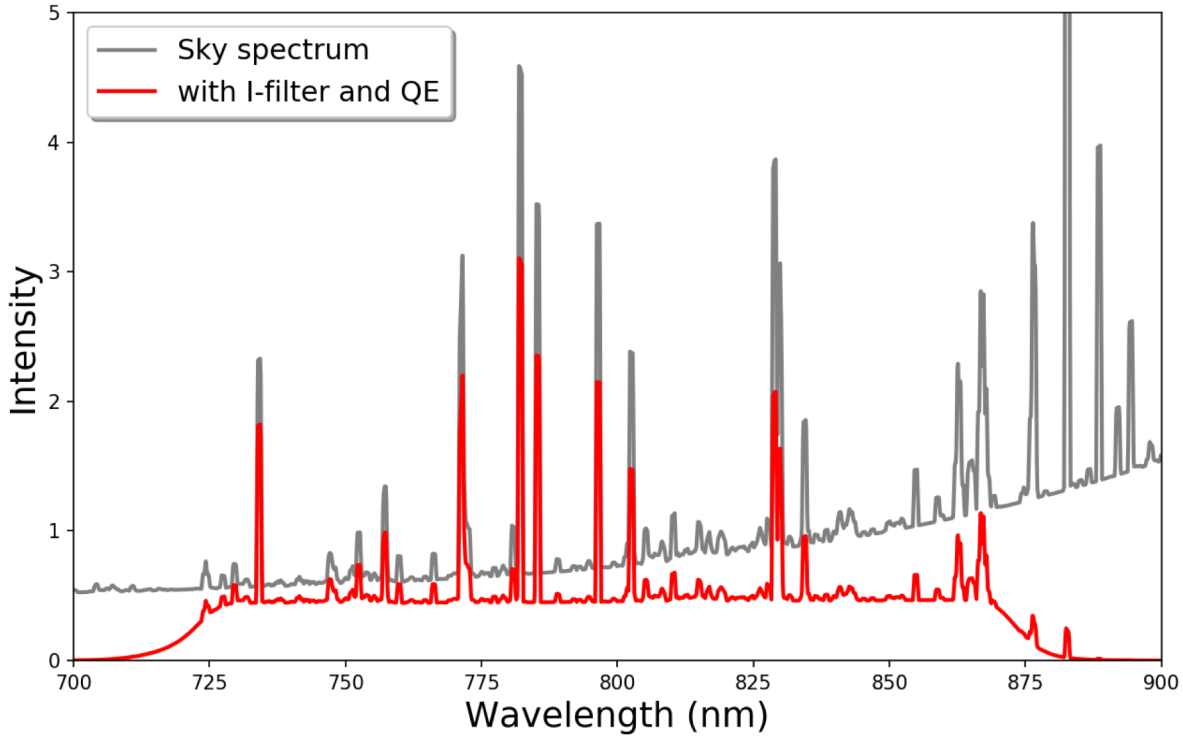


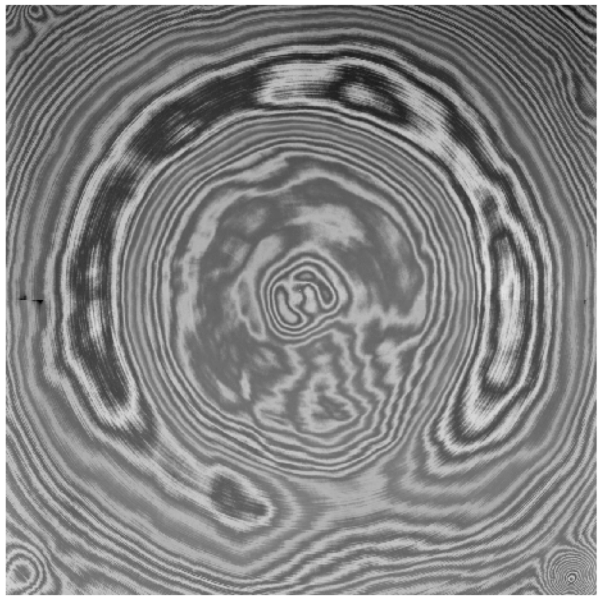


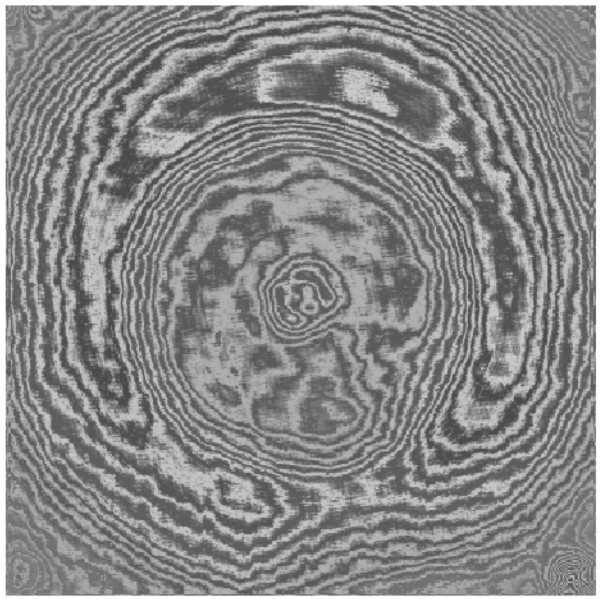
LED ratio filterless with sky spectrum and QE

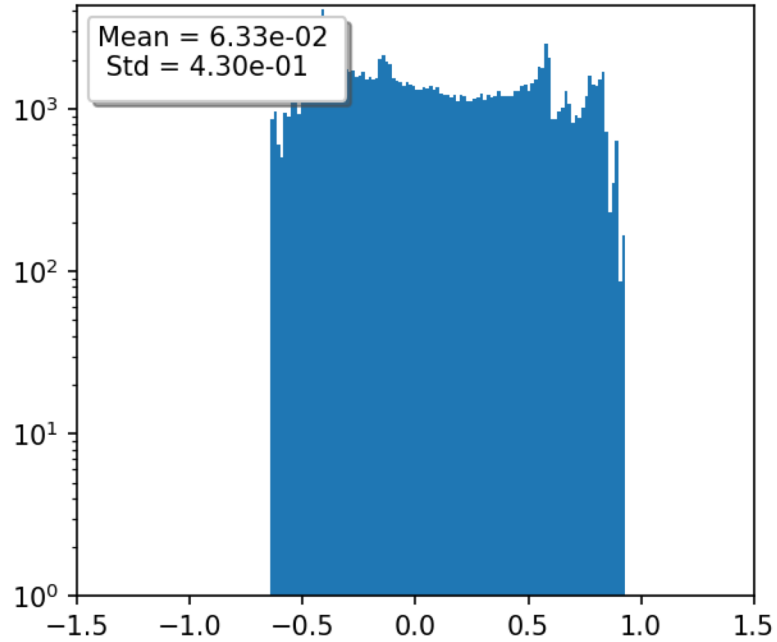
Mean fringing maps with

- $700 < \lambda < 900$ nm
  sky by steps of 0.1 nm
- $d = 25$ µm
- $r = 0.5$
- $n_{\mathrm{Si}} = 3.6$









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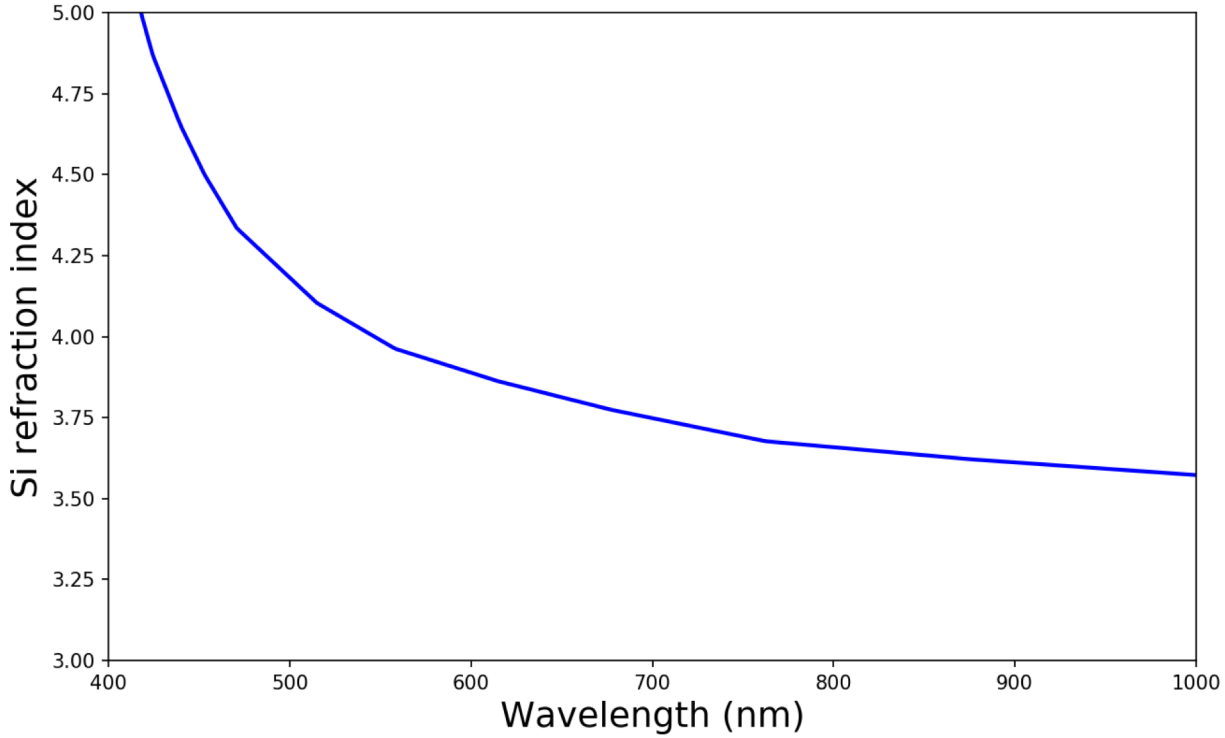

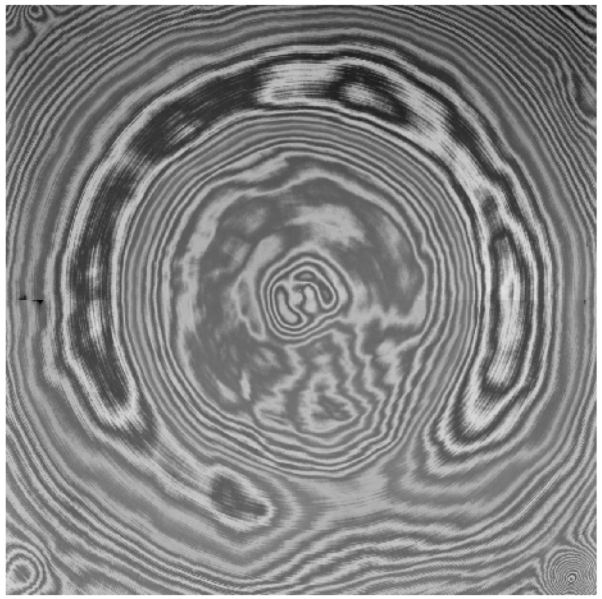

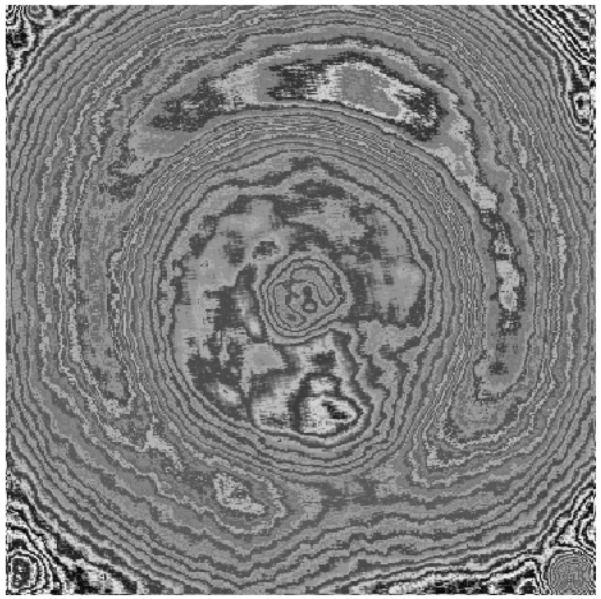

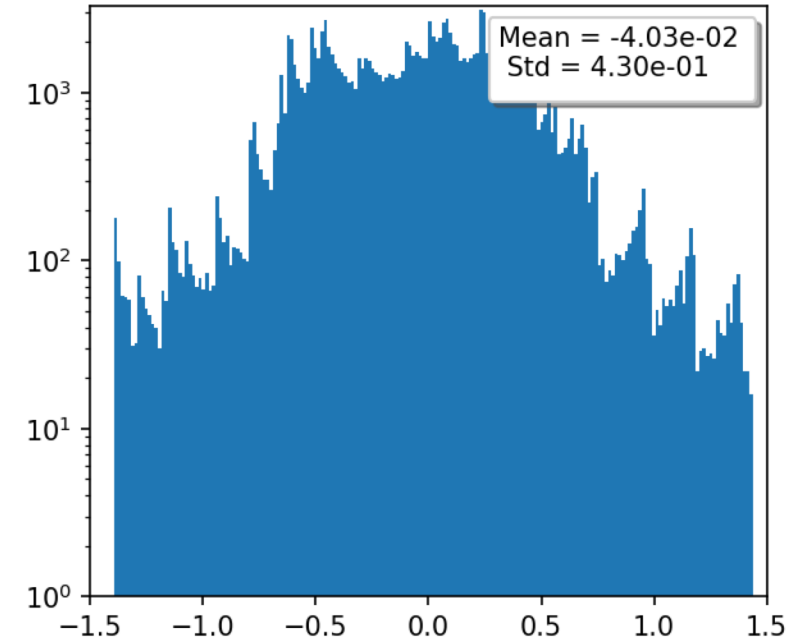

Mosaic fringing model

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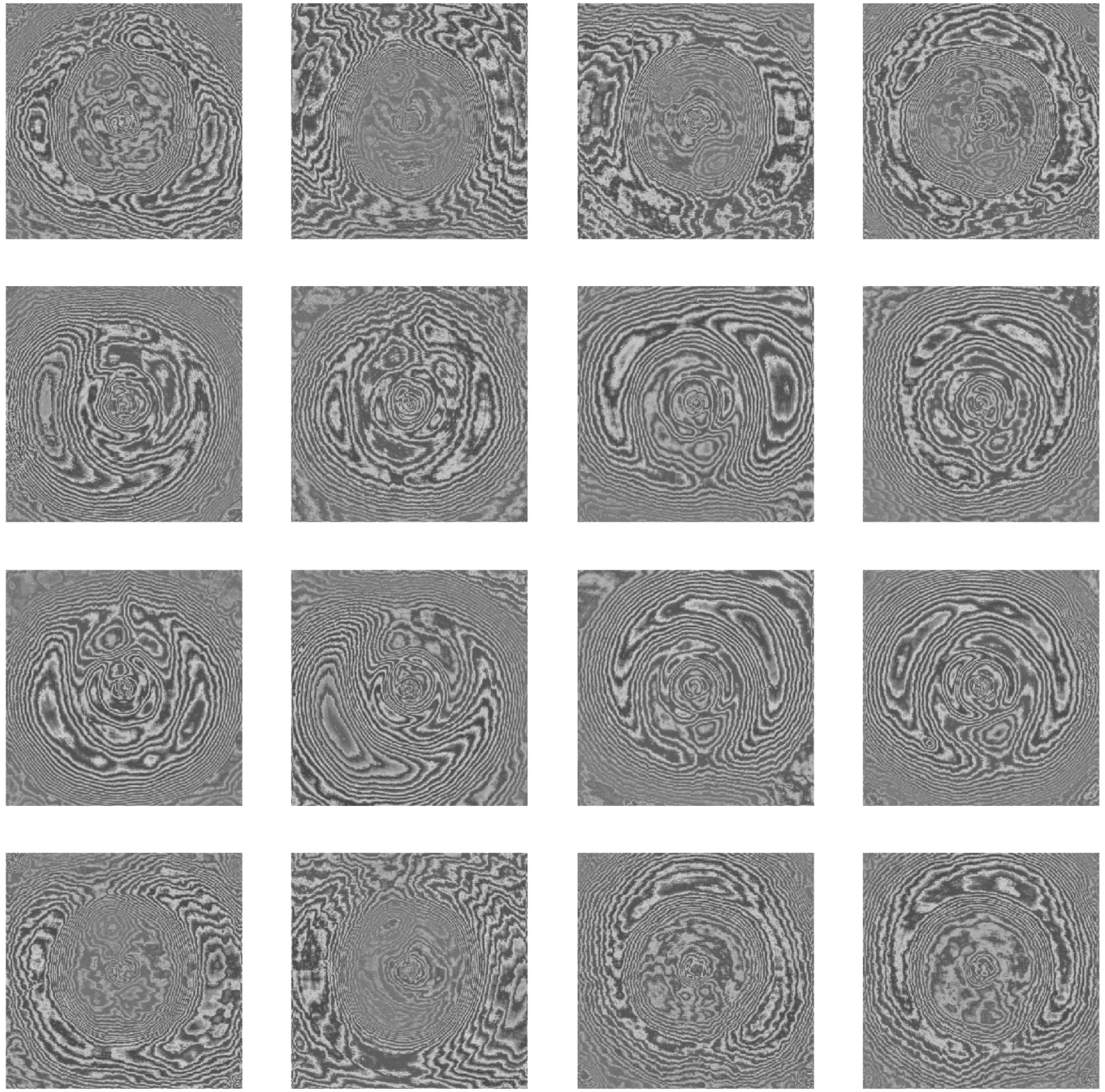
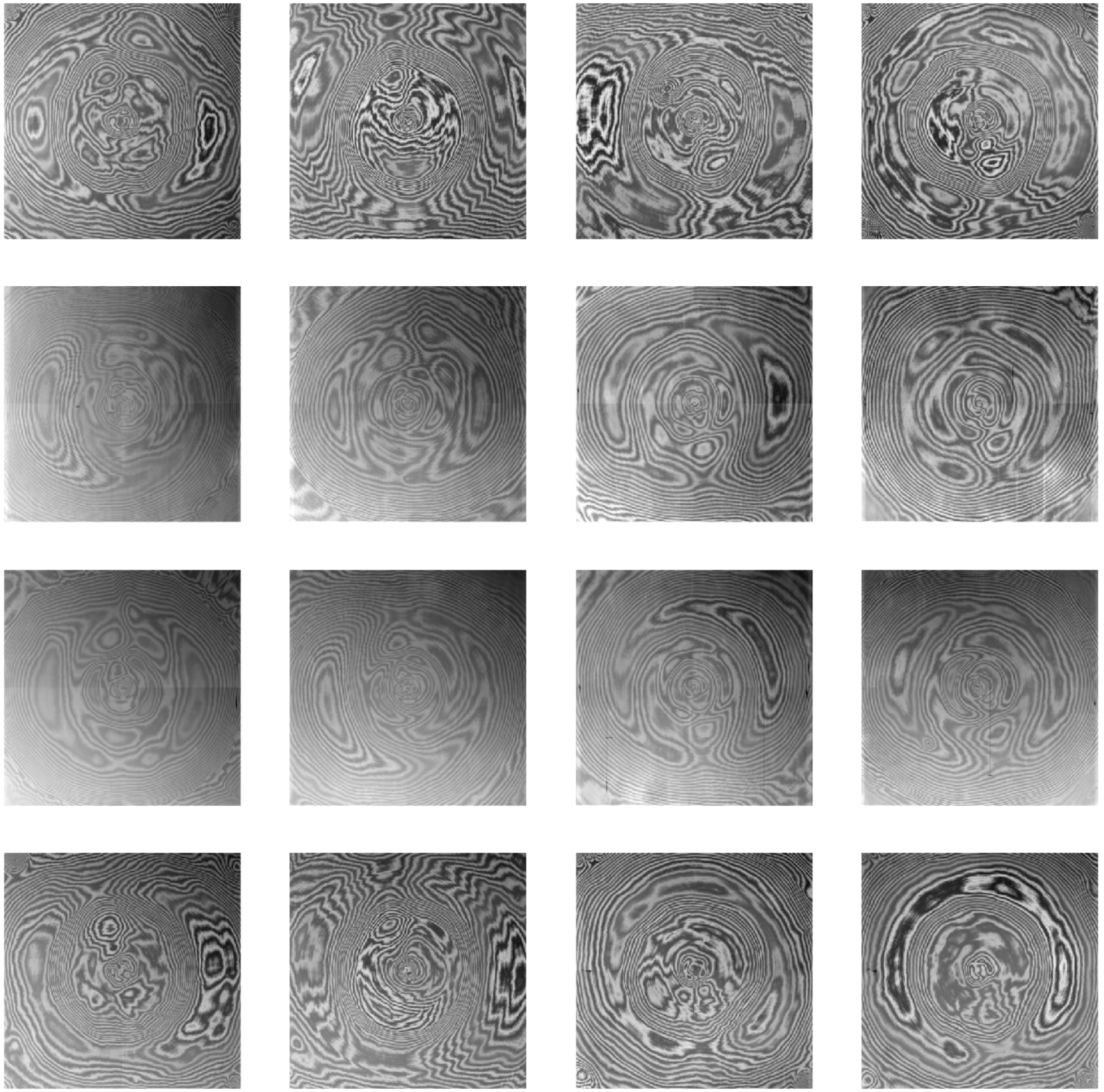


Mosaic observed fringing



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