24 August 2023, Rudolf

**Running Streamlit on MacBook Pro, using the latest code available in the main branch of the GitHub repository PolarizedLightFieldMicroscopy/forward-model**

I processed guv3, guv4, and guv5 objects with and without noise, generated using BirefrObjectGeneratorJuly2023.nb. For reconstructions, I used default parameter settings.

**Optical settings:**

Number of microlenses: 31

Pixels per microlens: 17

with SS=1, the reconstruction seems to work

Number of voxels per microlens (supersampling): 1

Magnification: 60

NA of objective: 1.2

Wavelength of light: 0.55 µm

camera pixel size: 6.5 µm

refractive index of medium: water n=1.35

**guv3\_GT.h5 ->guvBir[radius=6.5, membrane thickness=1, Δn=0.01]**

Number of microlenses: 31

Number of voxels per microlens (supersampling): 1

Volume shape: [15, 61, 61]

A picture containing pattern, symmetry, colorfulness, art

Description automatically generated A picture containing screenshot, colorfulness, plot, line

Description automatically generated

**Reconstruction, using internal random initial volume:**

**A close-up of a graph

Description automatically generated**

**Reconstruction, using guv3BN2.h5 as initial volume:**

**A close-up of a graph

Description automatically generated**

**Reconstruction, using guv3N1.h5 as initial volume:**

**A close-up of a graph

Description automatically generated**

**Reconstruction of guv3N1, using internal random initial volume:**

**A diagram of a number of colored circles

Description automatically generated with medium confidence**

**Reconstruction of guv3N1, using guv3BN2 as initial volume:**

**A close-up of a graph

Description automatically generated**

**guv5\_GT.h5 ->guvBir[radius=19.5, membrane thickness=3, Δn=0.01]**

**Reconstruction of guv5\_GT, using internal random initial volume:**

Number of microlenses: 31

Number of voxels per microlens (supersampling): 3 (there are problems with SS=3)

Volume shape: [45, 183, 183]

possible phase wrapping

Number of iterations: 11

**A diagram of a diagram of a circle

Description automatically generated with medium confidence**

**Reconstruction of guv5\_GT.h5, using guv5N1\_GT.h5 as initial volume:**

Epoch 1:

A close-up of a graph

Description automatically generated

Epoch 10 (the estimated volume and its light field images seems to move away from GT):

A close-up of a graph

Description automatically generated

**guv5B\_GT.h5 ->guvBir[radius=19.5, membrane thickness=3, Δn=0.001]**

**Reconstruction of guv5B\_GT, using guv5BN0 as initial volume:**

no phase wrapping

Epoch 1:

**A diagram of a diagram

Description automatically generated with medium confidence**

Epoch 10: (again, the estimated volume and its light field images seems to move away from GT)

A close-up of a graph

Description automatically generated

**Reconstruction of guv5B\_GT, using random initial volume and SS=3 for generating light field images and SS=1 for reconstruction:**

Epoch 1:

A close-up of a graph

Description automatically generated

Epoch 10:

A close-up of a graph

Description automatically generated

Use guv4\_GT\_RetLFStream.tiff and guv4\_GT\_OrientLFStream.tiff as experimental light field images, this produces the Error message below:

