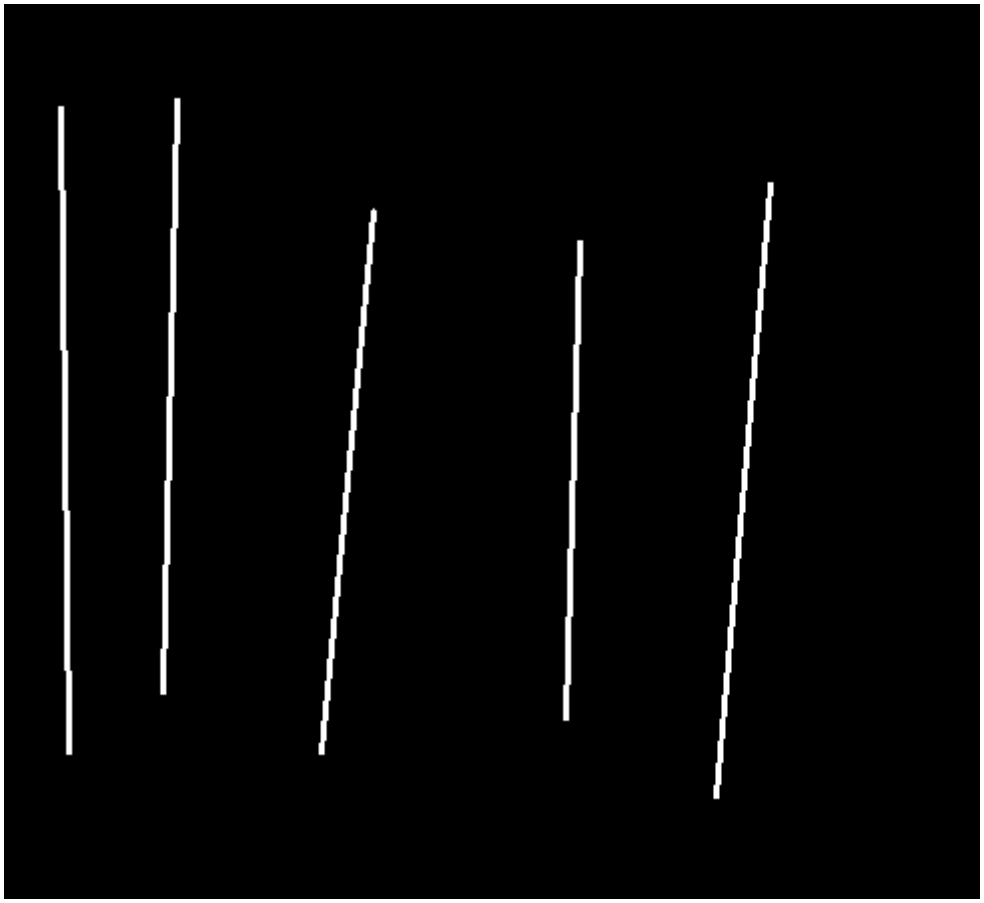
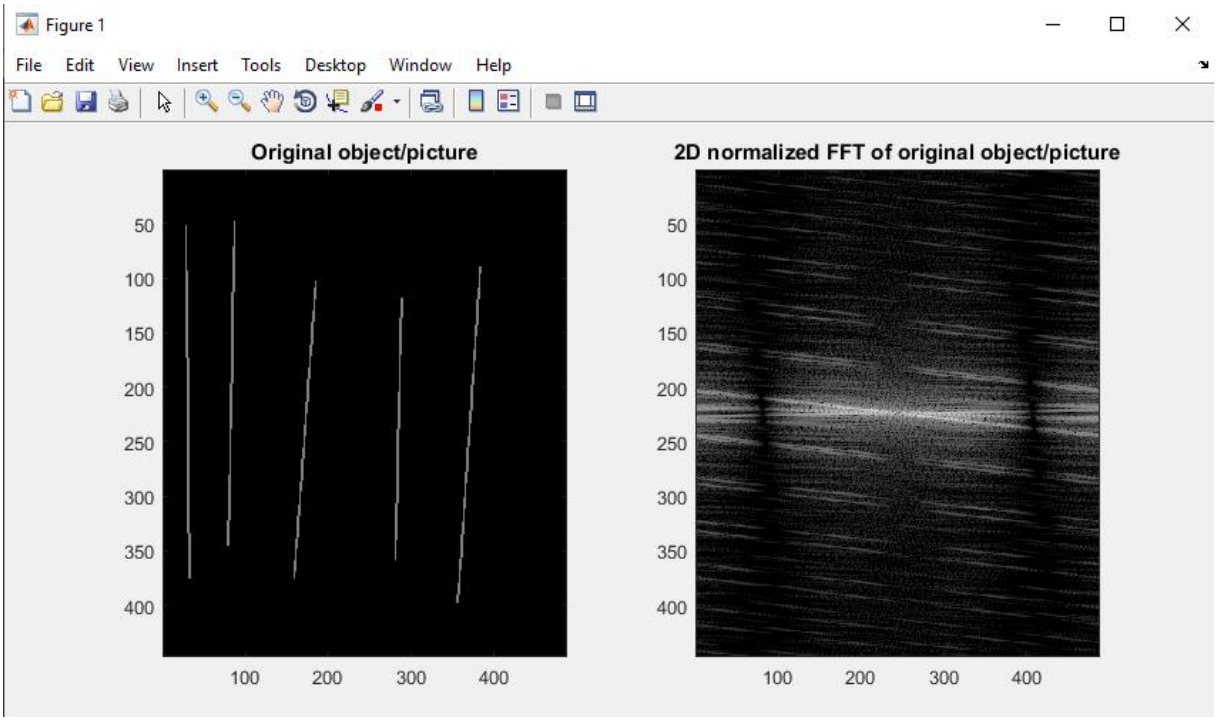
Signalbehandlign Ultralyd-avbilding: 2D Linear imaging systems
05.03.2020

Part 1

1.



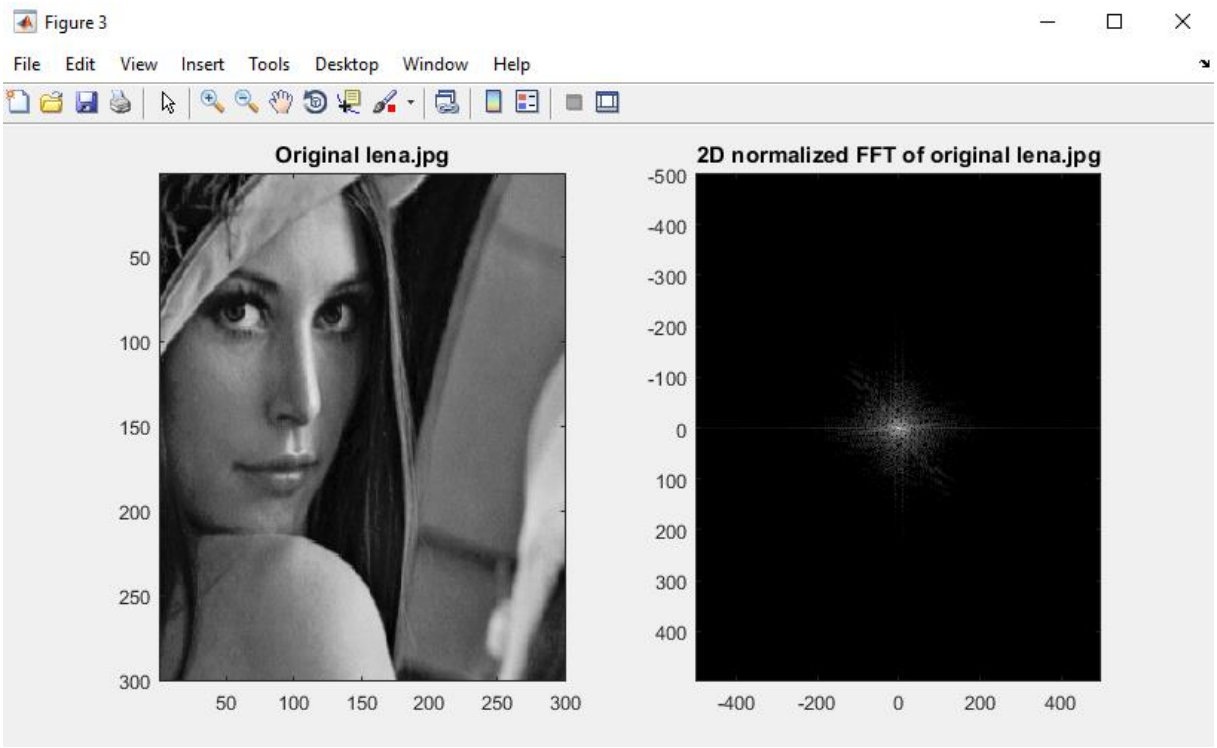


What I observe is that vertical lines get rotated 90 degrees in the Fourier domain. So horizontal become vertical in the Fourier domain, and vertical becomes horizontal. Another point to notice is that the power is highest in the middle of the 2D-fourier image, meaning that the lowest frequency contains the highest power/energy.

I have chosen not to include all the other images, just one as you can see.

Part 2

Lena:



Moving average filter:

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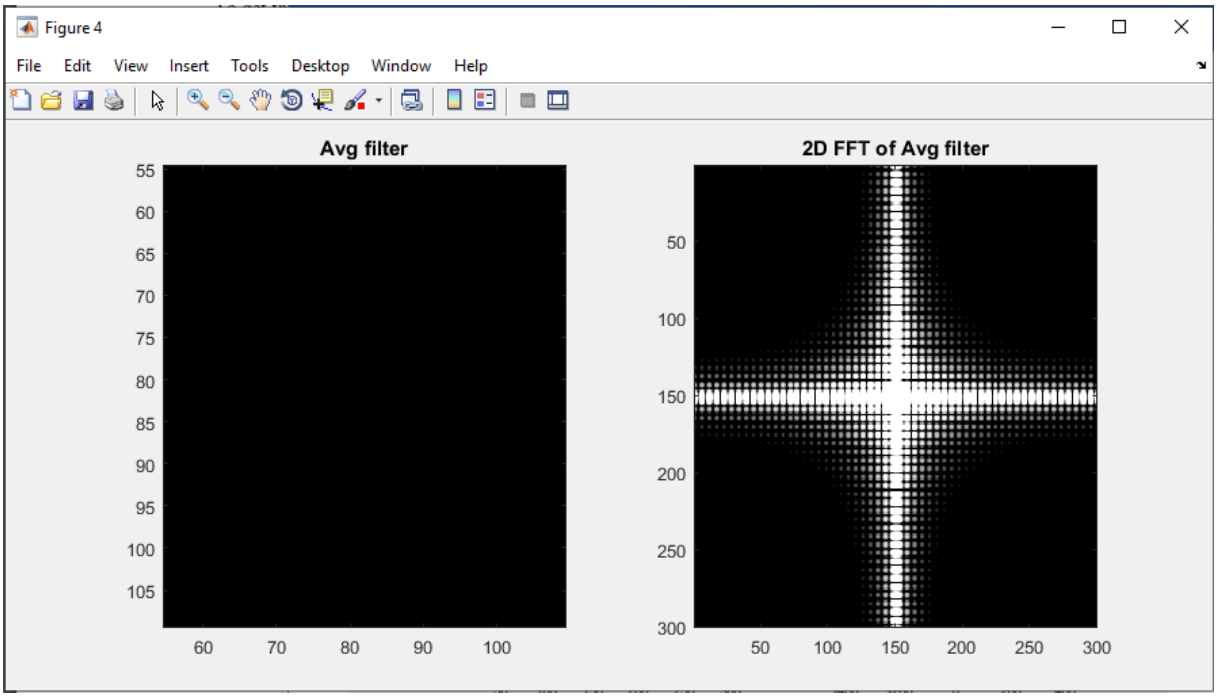
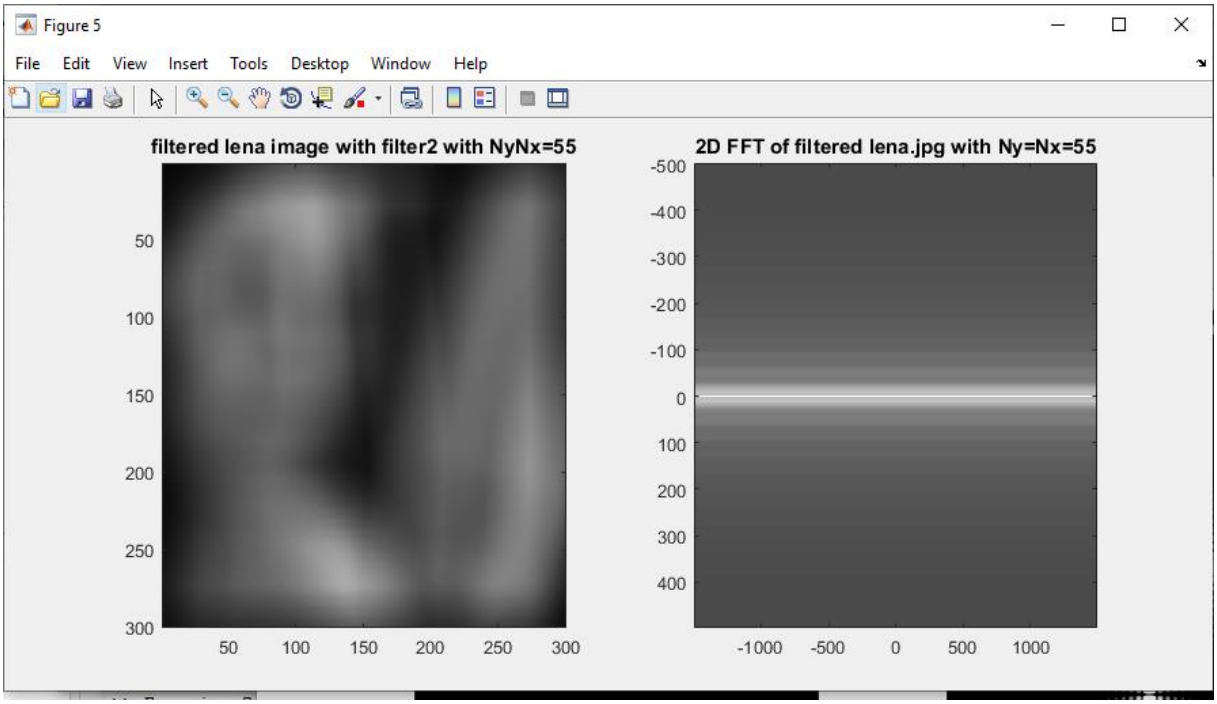


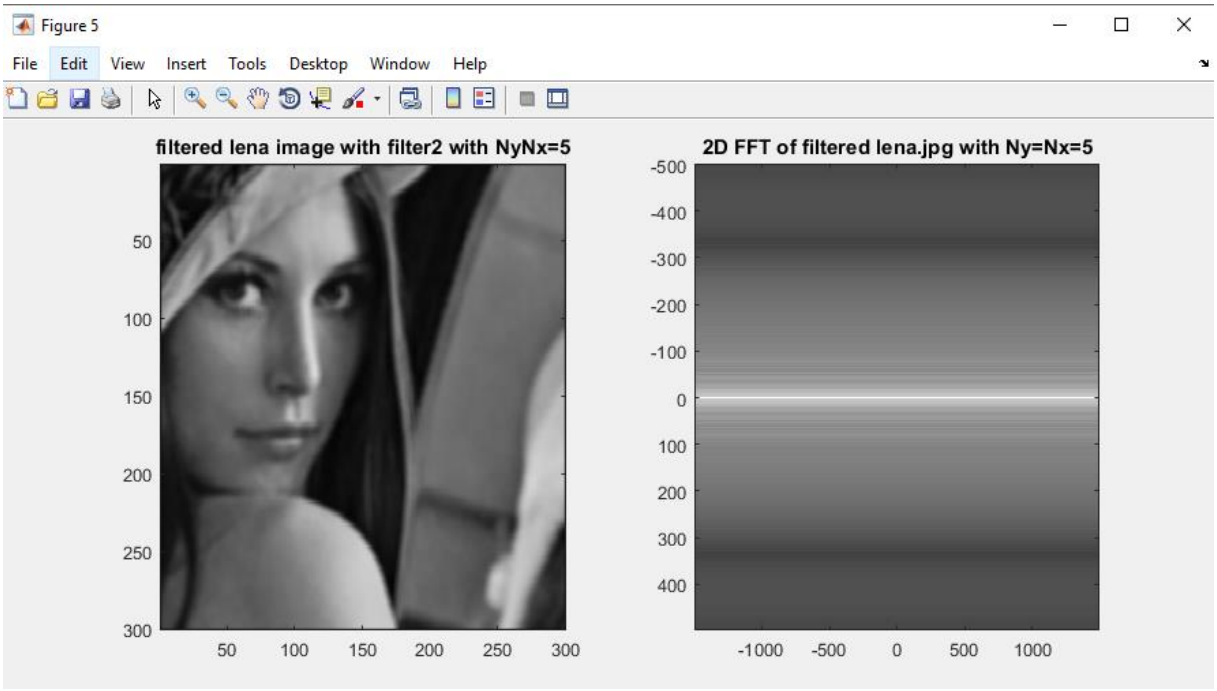
By filtering the image with the moving average filter and keeping these values:

```
Nx = 55;
Ny = 55;
```



By filtering the image with the moving average filter and changing these values to:

```
Nx = 5;
Ny = 5;
```



By vary the size of Nx and Ny, which in our case is the PSF. By making PSF smaller, the picture gets better or the resolution increases. By making the PSF larger the picture becomes one big blob which is smeared out. This is due to the size of PSF, which in our case means how much we want a pixel to be averaged over, the how large is the reagion that we average and asign that pixel.