

Data have been collected at two different settings:  
 in ToF mode only (nominal range of  $\lambda$  from 2Å to 20Å) at two  $\Delta\lambda/\lambda$ ,  
 and in mixed monochromatic mode using ToF + NVS (neutron velocity selector),  $\lambda=4.6\text{Å}$  and  $\lambda=6\text{Å}$ .

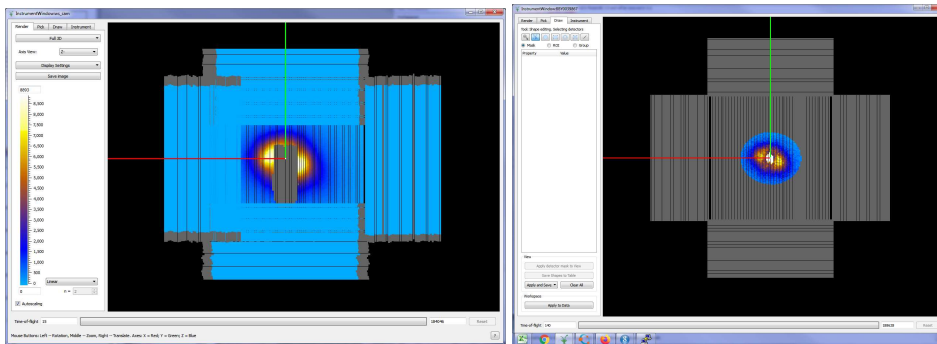
Dr Anna Sokolova, Bilby SANS instrument ACNS, ANSTO, 2020

<https://www.ansto.gov.au/our-facilities/australian-centre-for-neutron-scattering/neutron-scattering-instruments/bilby-small>

Three sample provided by Dr Brian Paww - masks - with different pore diameter and pores spacing have been used. Each data set has been collected for ~15min.

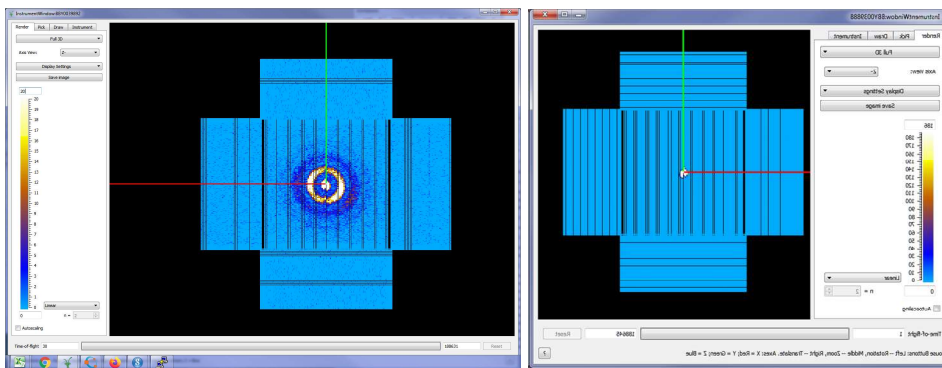
**The first thing to notice: the transmission is massive.**

For example, Mask3 and its huge transmission (ToF mode):



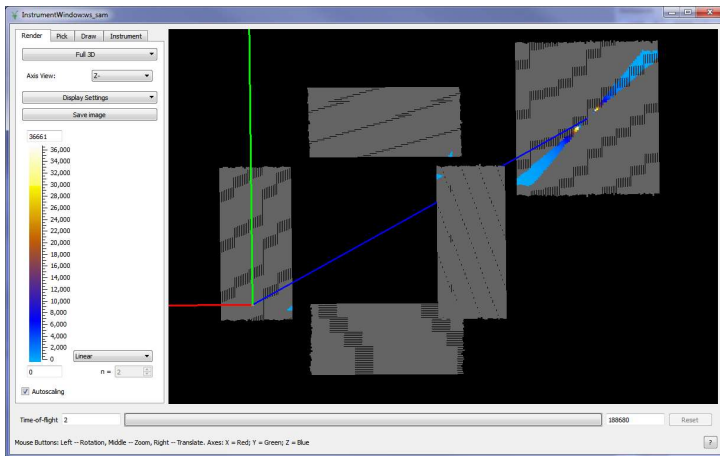
Transmission BBY0039892 (Velocity selector – NVS - only)!!!

To compare: empty beam BBY0039888

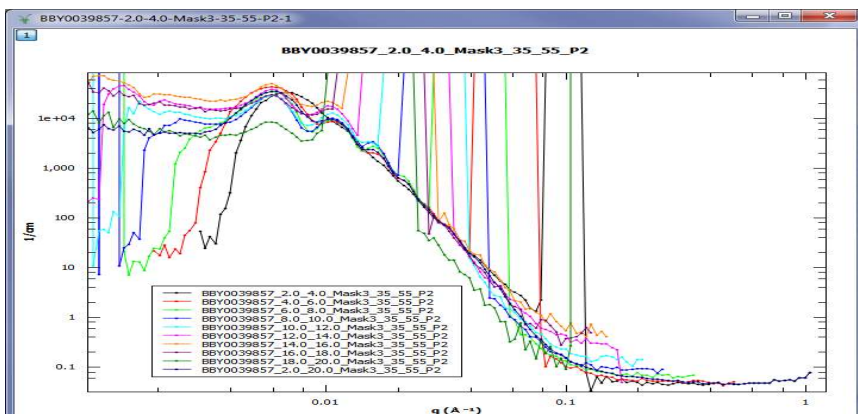
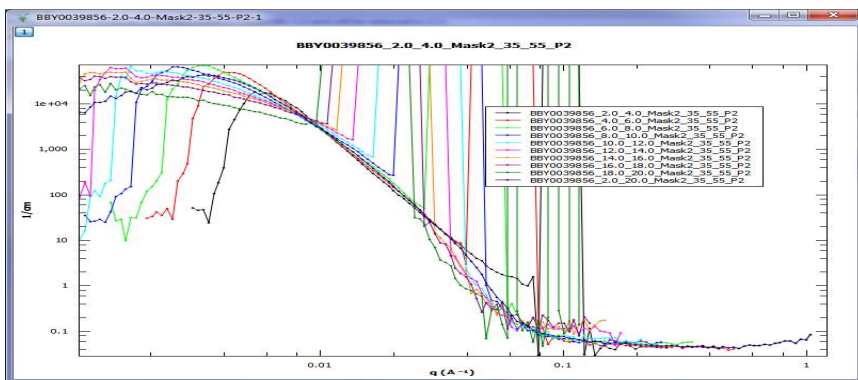
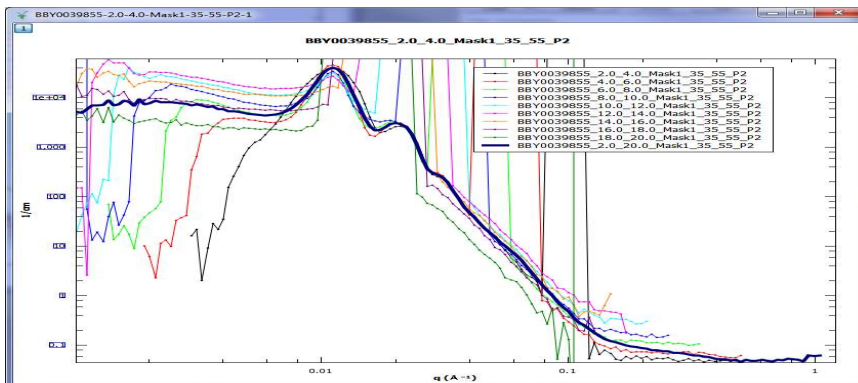


**To remove influence of non-symmetry in the data, averaging within a small sector has been performed.**

For example: P2 symmetry mask, 35-55deg cut:



**The problem: NO matching for the wavelength slices!!**



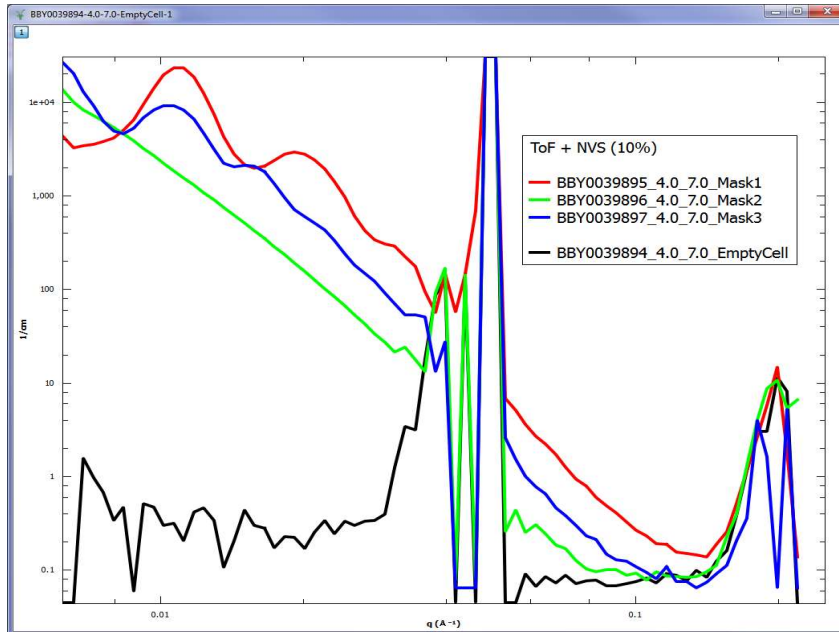
## Multiple scattering estimated on data from a flux configuration:

Limits (max wavelength without influence of multiple scattering) calculated (<10% scattering comparing to the transmitted beam): *Mask 1: 3Å; Mask2: 5Å; Mask3: 4Å.*

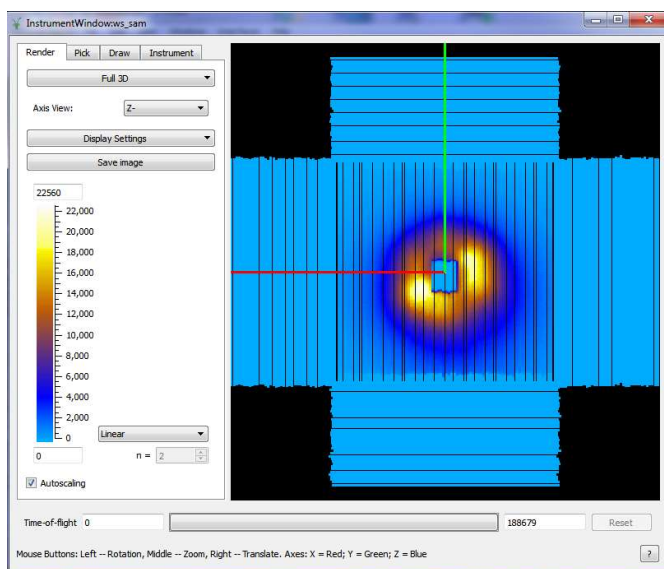
Obviously, there is a multiple scattering everywhere.

## Monochromatic 6Å + ToF - example:

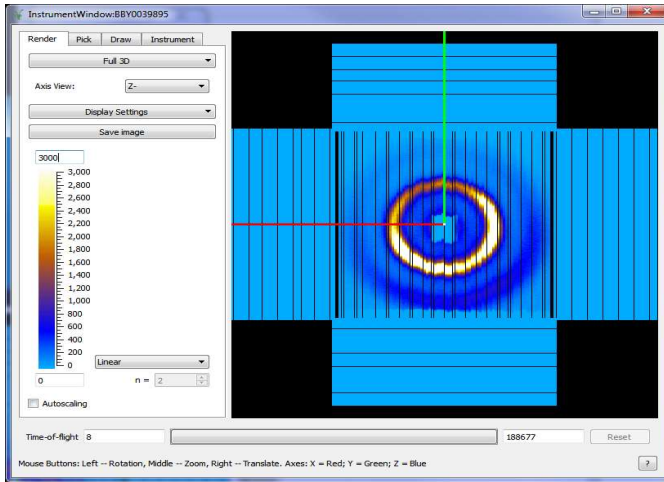
The gap on this and any following data are caused by separation between detectors.



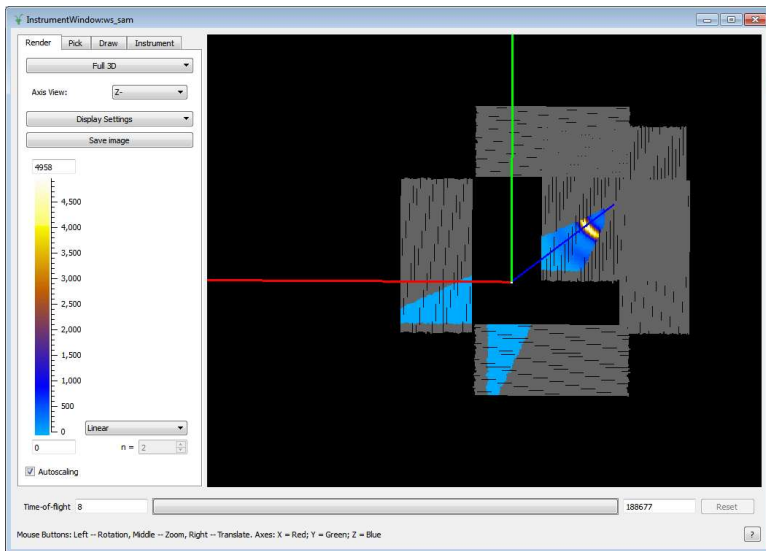
## Mask1 BBY0039870



# Mask 1 NVS BBY0039895

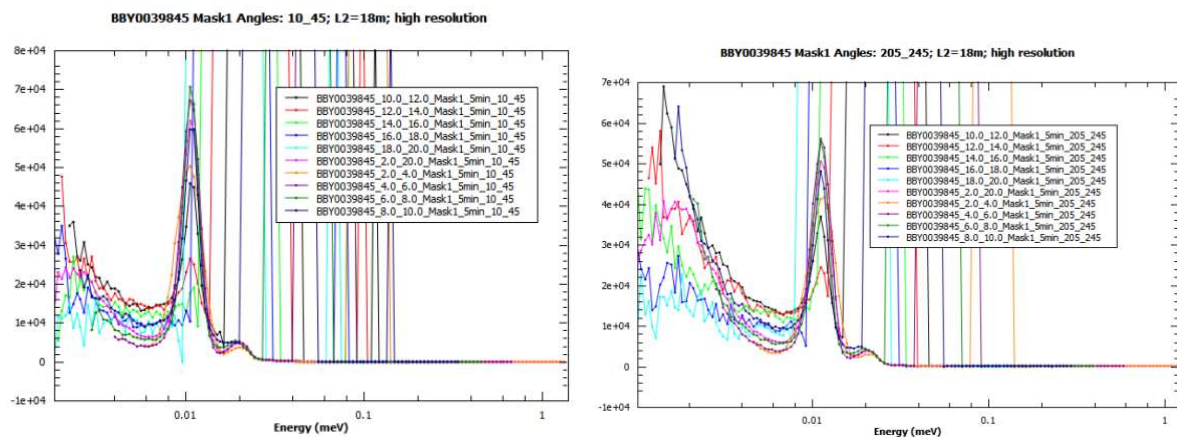


Example of a sector mask: angles 205-245deg (0 angle is along positive OX):

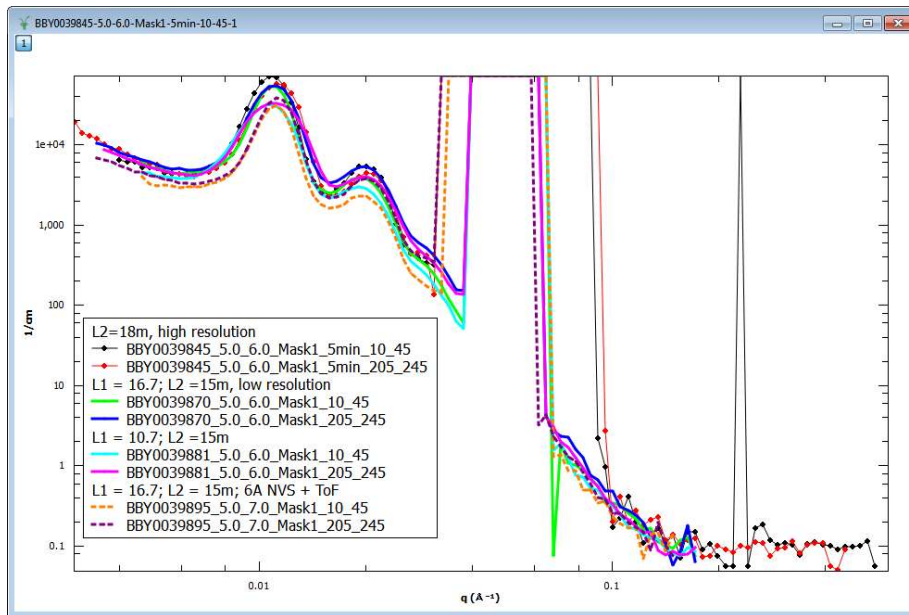


All other masks are created following the same principle.

Example of bad wavelength match, even only on narrow sectors:



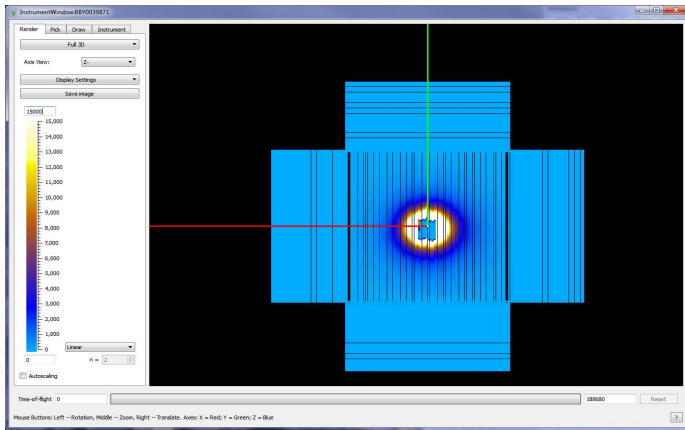
Summary data, only very narrow wavelength band is taken into account. I would think that some peaks are off because of samples misalignment (pores are not strictly perpendicular to the sample surface):



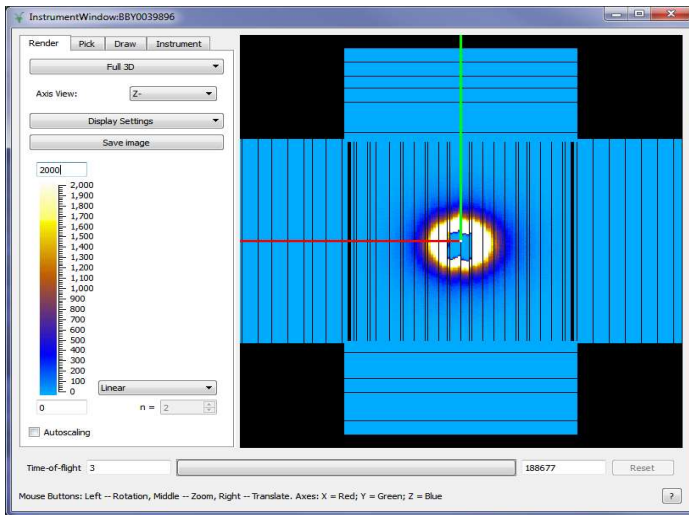
//Note:

- BBYxxxxxx is a standard for Bilby data files
- 5.0\_6.0: is a wavelength slice
- 10\_45, 205\_245 etc – range of the sector used for averaging

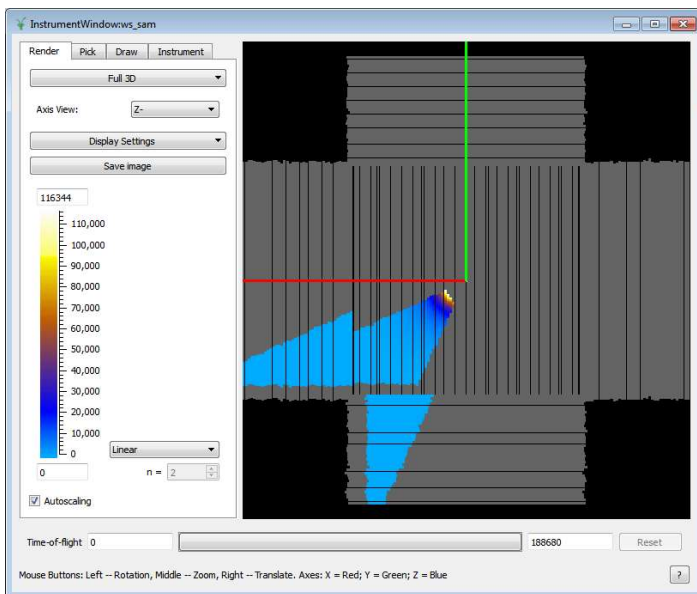
## Mask2, high resolution BBY0039871



## Mask 2NVS BBY0039896

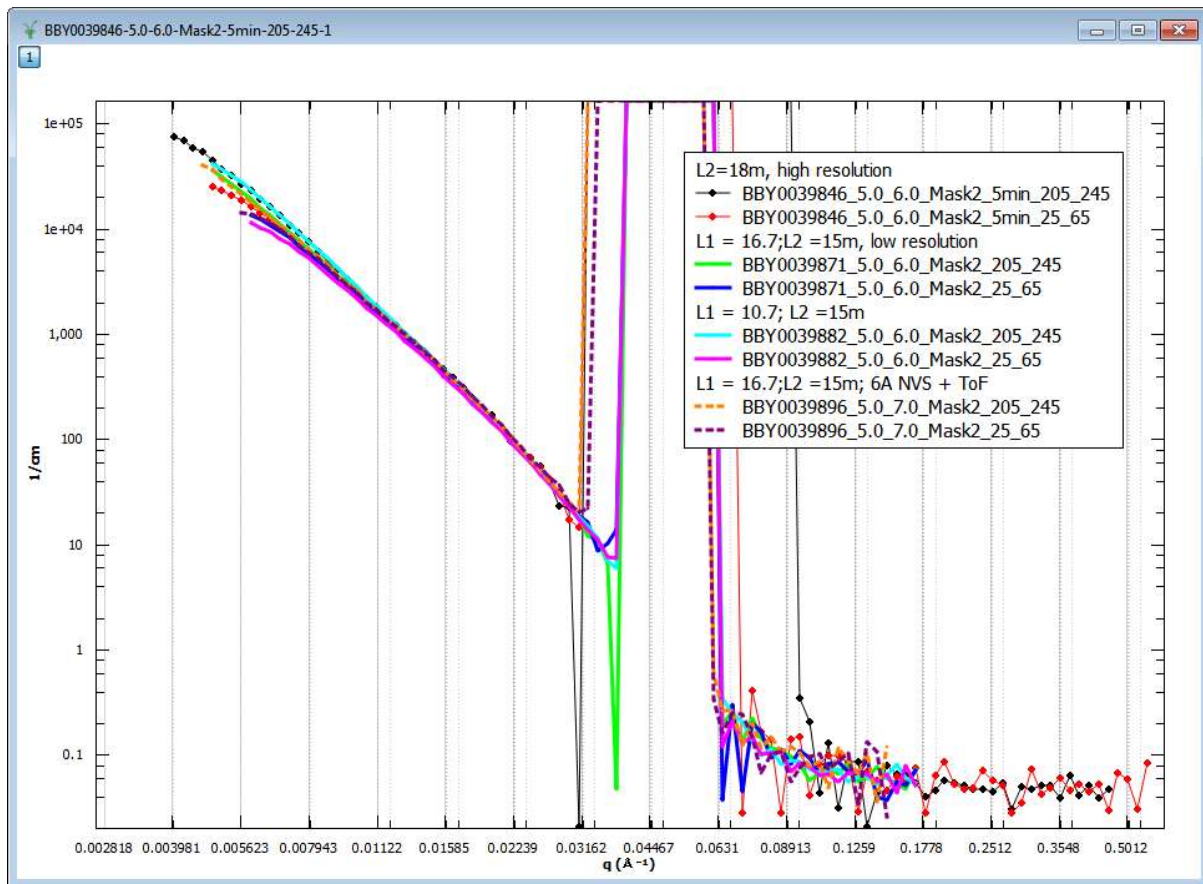


Example of a sector mask: angles 205-245deg (0 angle is along positive OX):



Summary data, only very narrow wavelength band is taken into account.

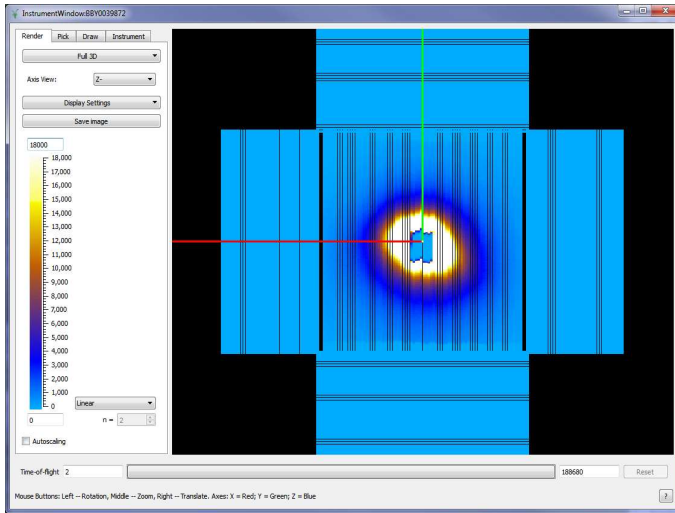
Multiple scattering effect is bad:



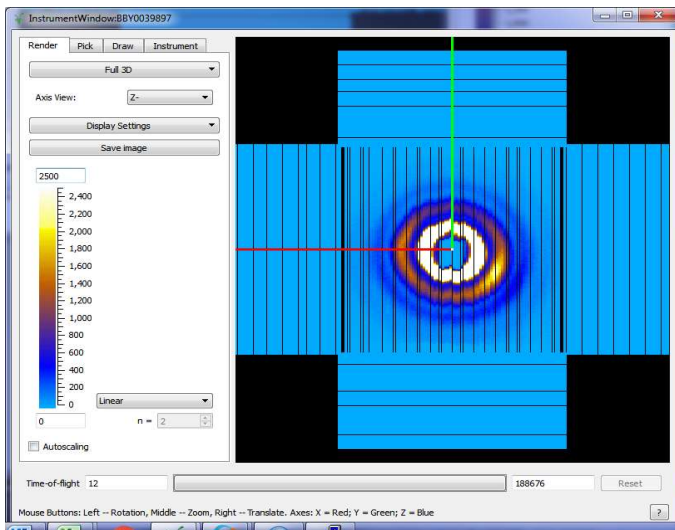
//Note:

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- 10\_45, 205\_245 etc – range of the sector used for averaging

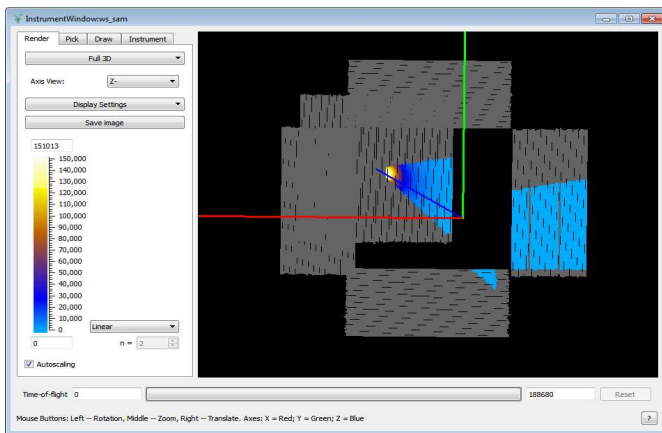
### Mask 3 BBY0039872



### Mask3 NVS BBY0039897

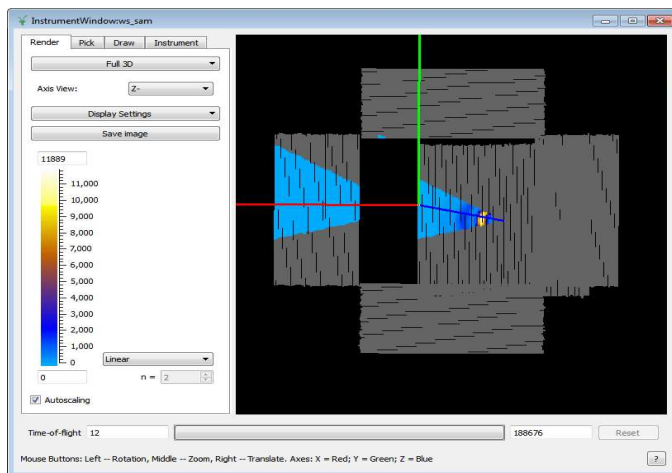


Example of a sector mask: angles 315-10deg (0 angle is along positive OX):

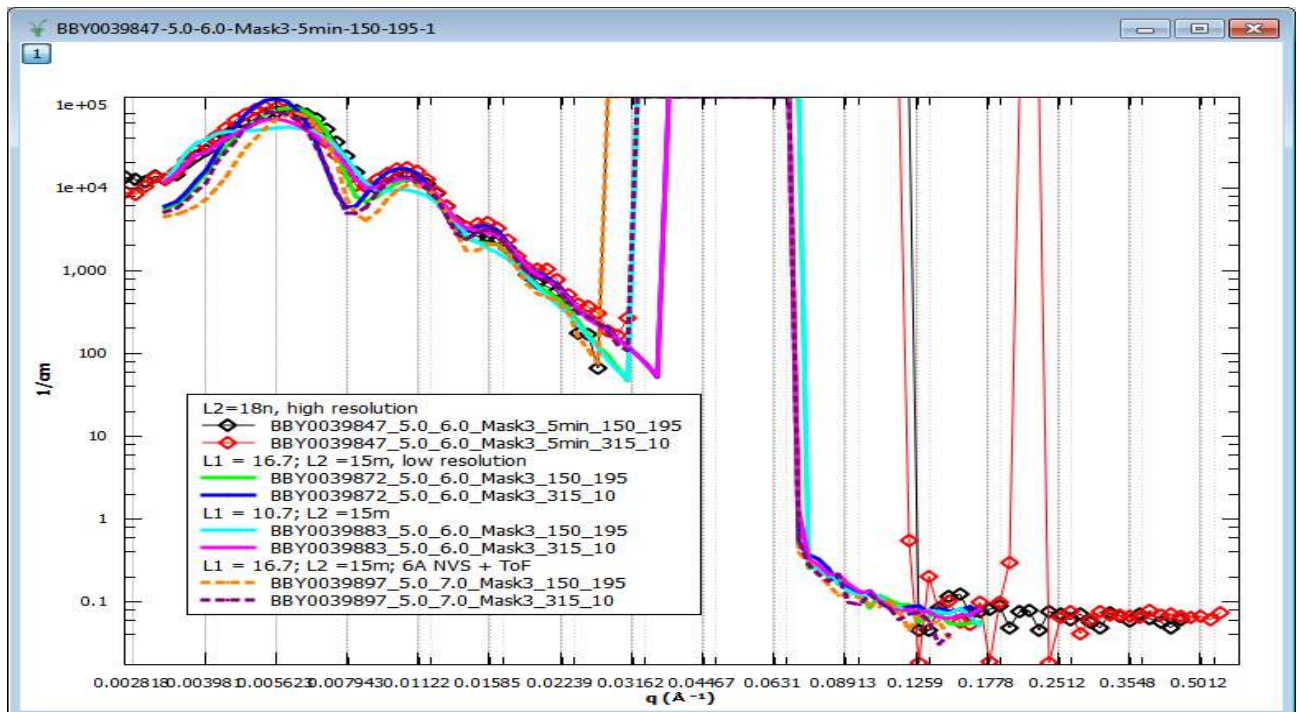




Example of a sector mask: angles 150-195deg (0 angle is along positive OX):



Summary data, only very narrow wavelength band is taken into account.



//Note:

- BBYxxxxxx is a standard for Bilby data files
- \_5.0\_6.0: is a wavelength slice
- 10\_45, 205\_245 etc – range of the sector used for averaging