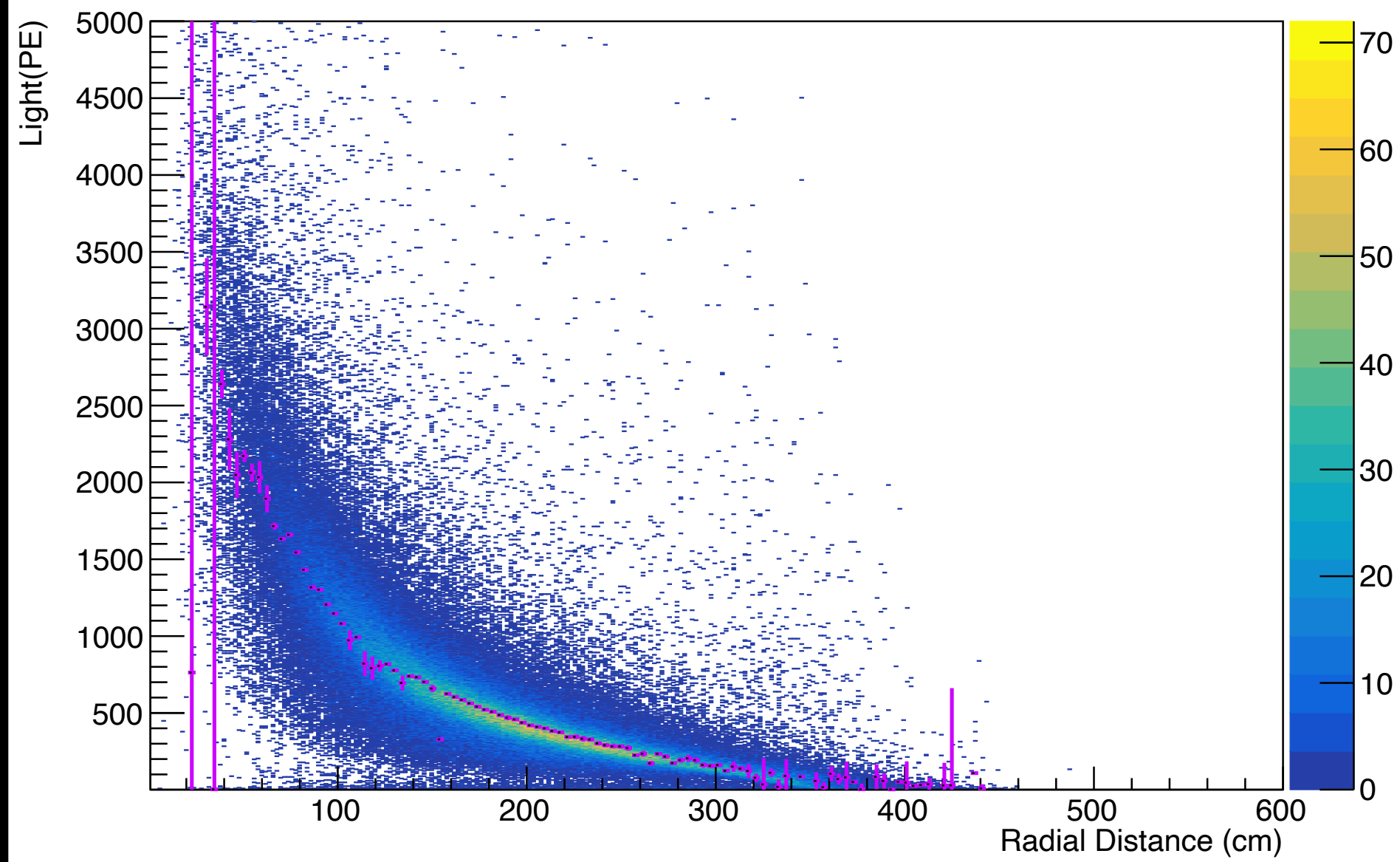


# Attenuation Monte Carlo Update

Kyle Spurgeon

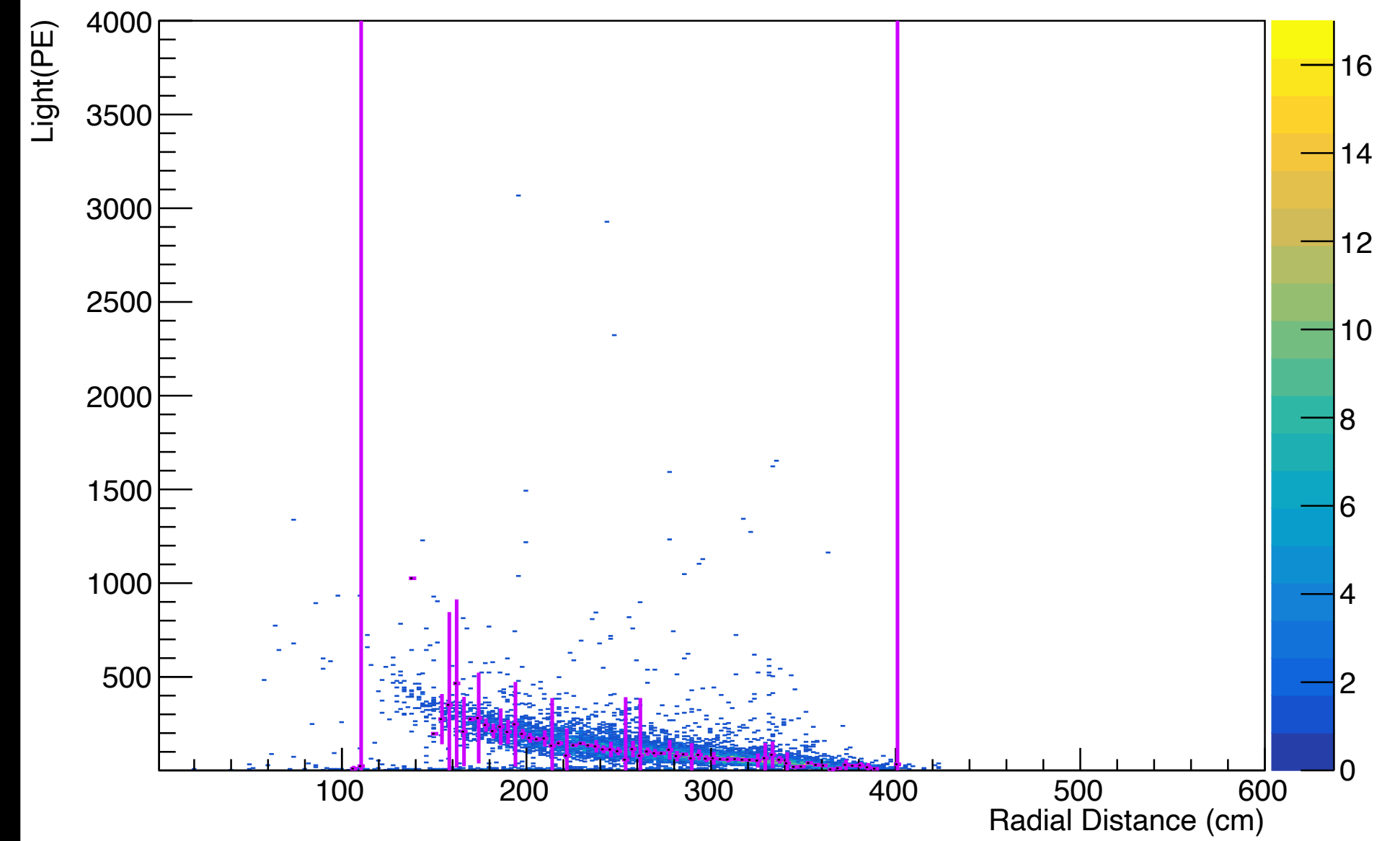
ARAPUCA Attenuation in LAr



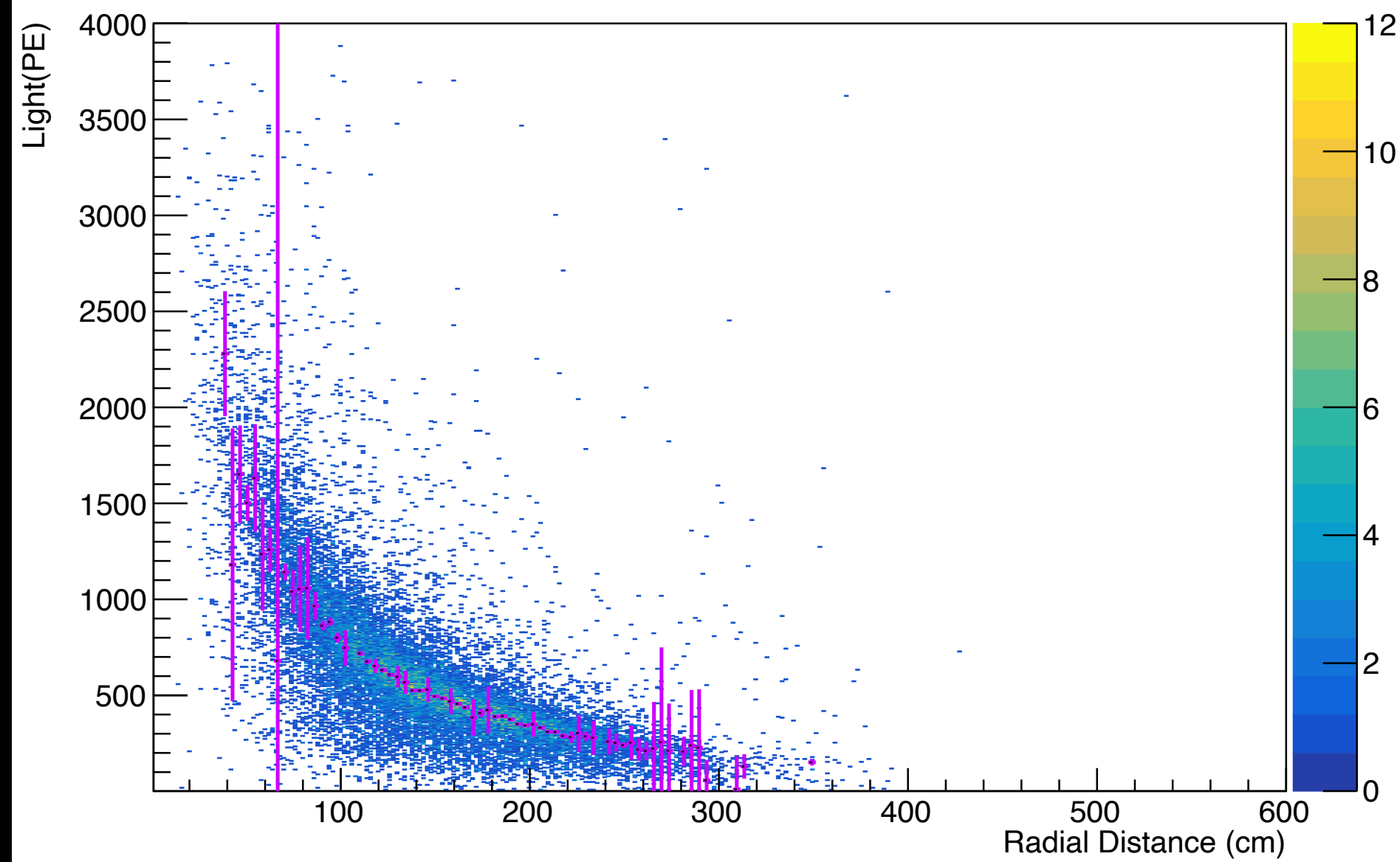
+N



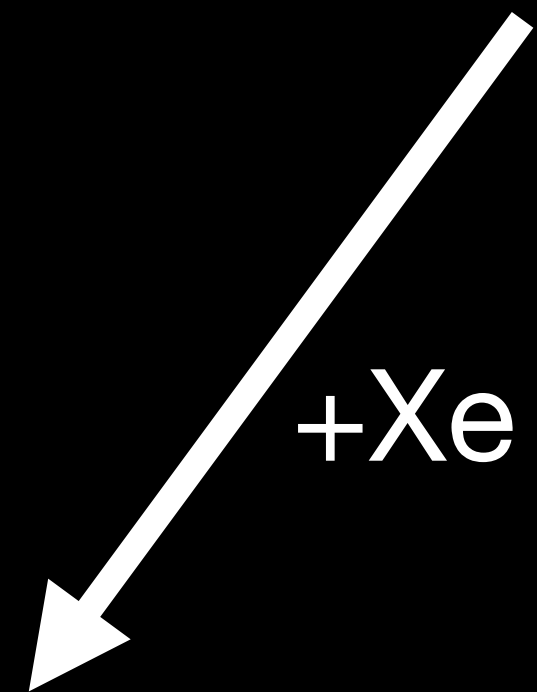
ARAPUCA Attenuation in LAr + N



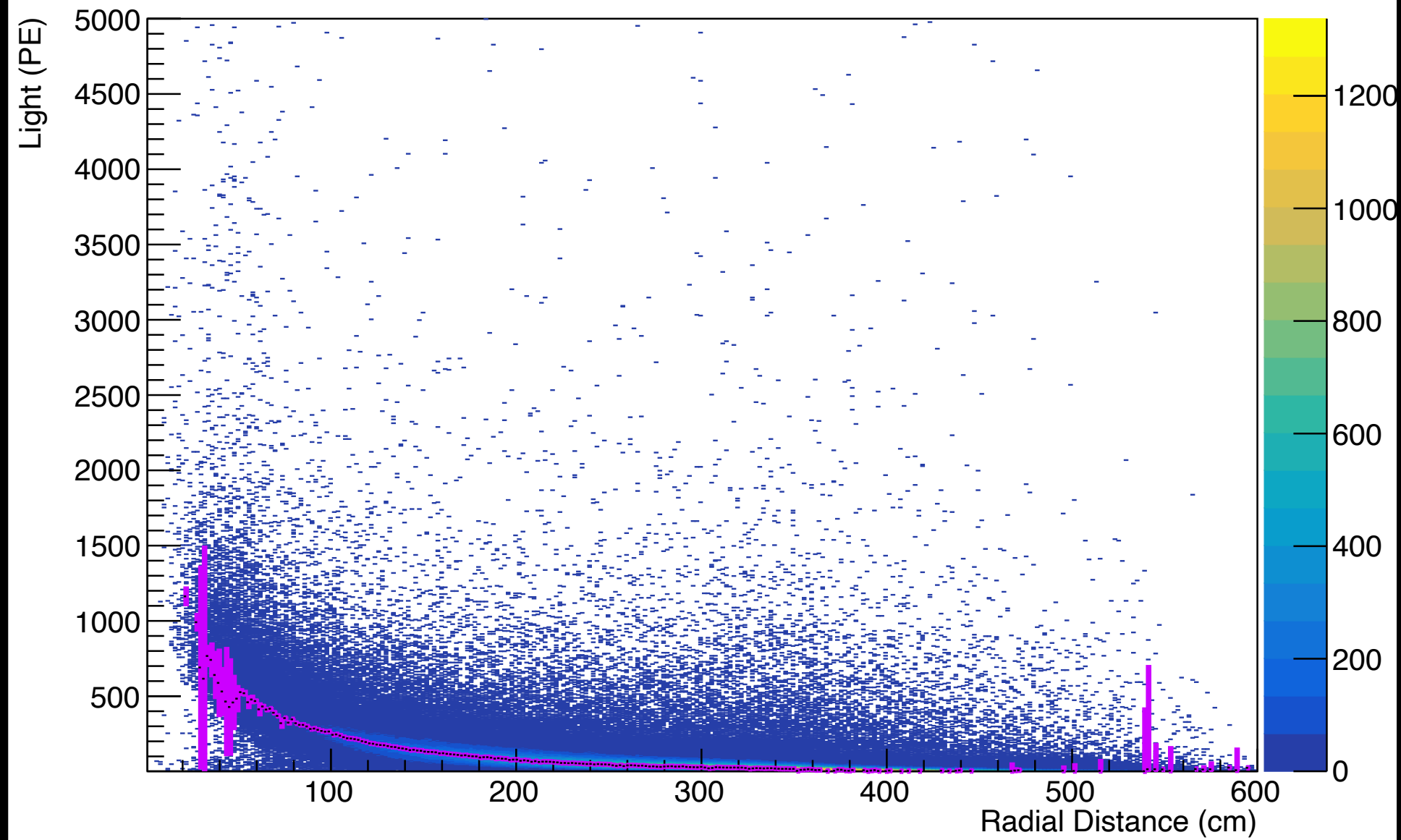
ARAPUCA Attenuation in LAr + N + Xe



+Xe



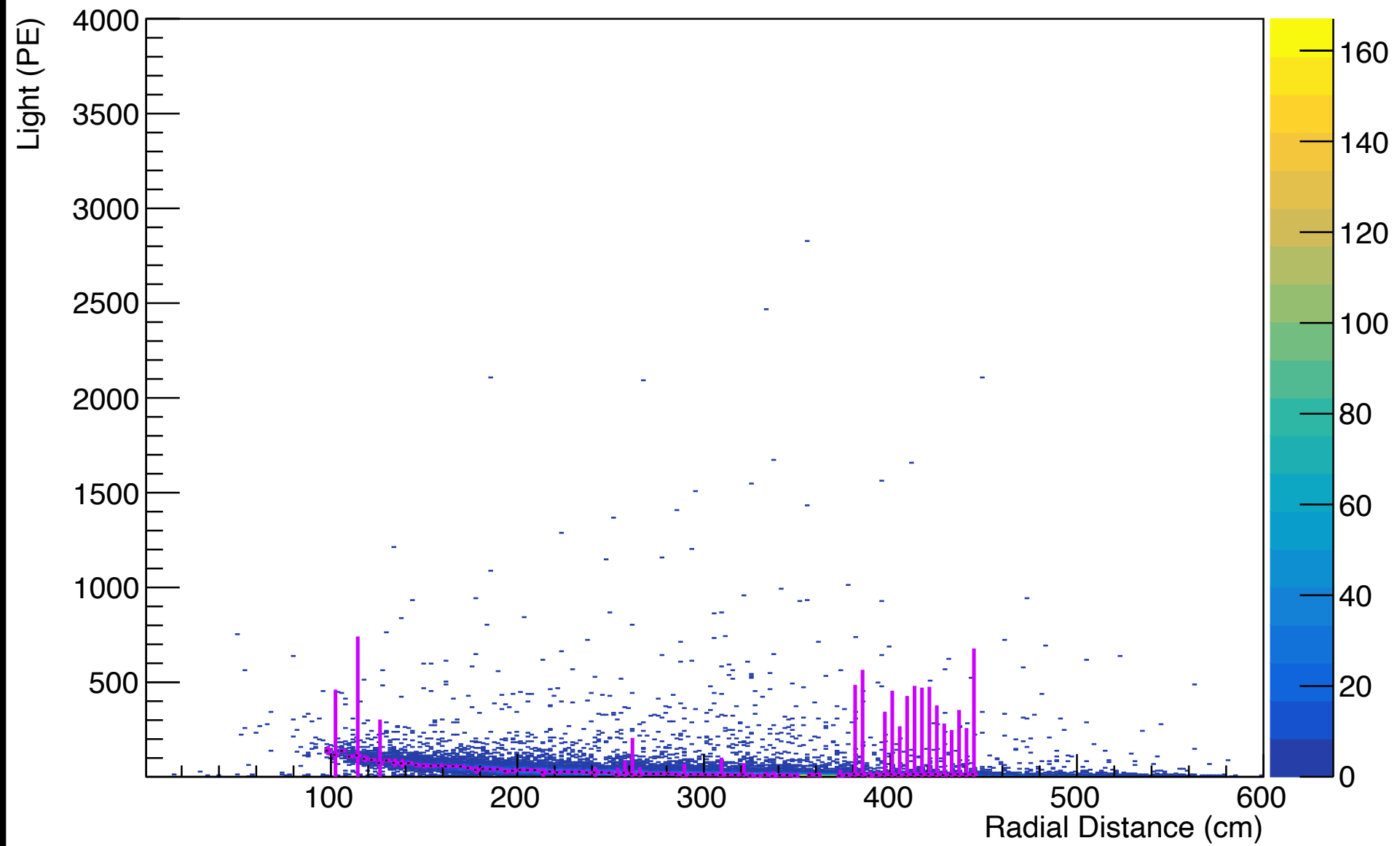
IU SensL Attenuation in LAr



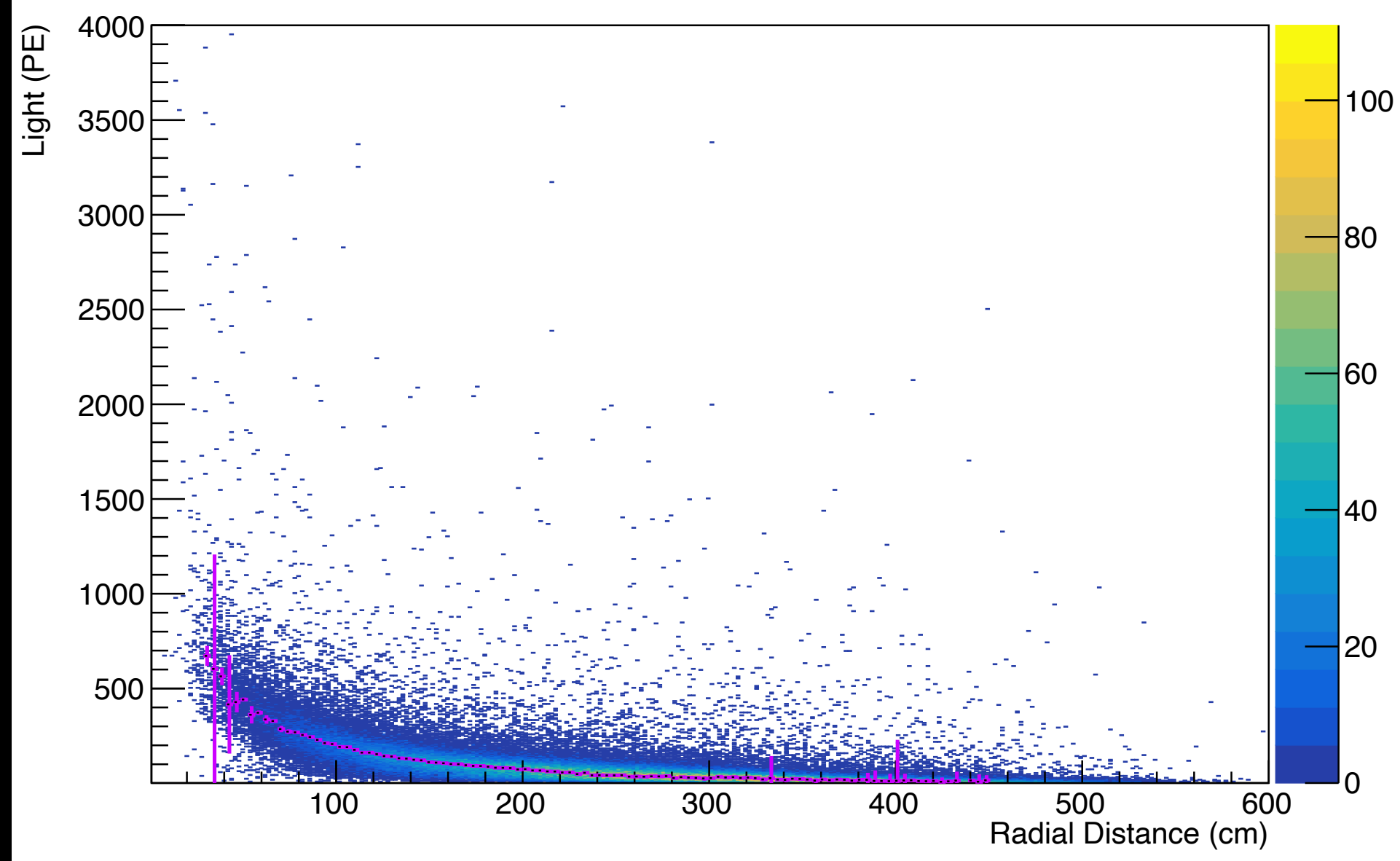
+N



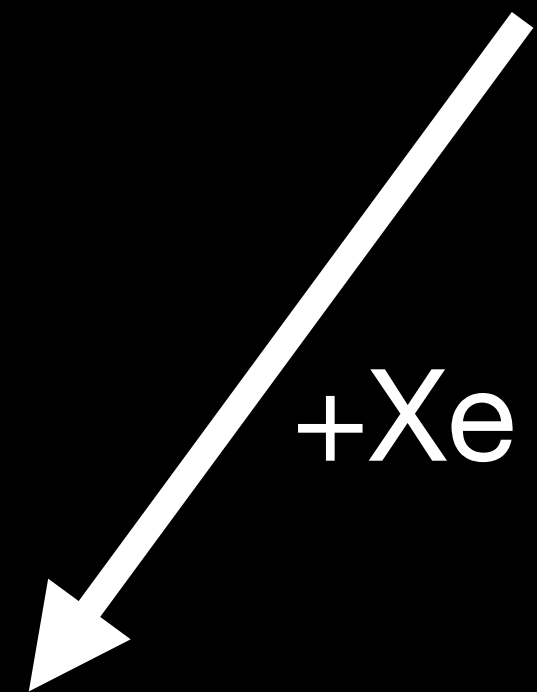
IU SensL Attenuation in LAr + N



IU SensL Attenuation in LAr + N + Xe



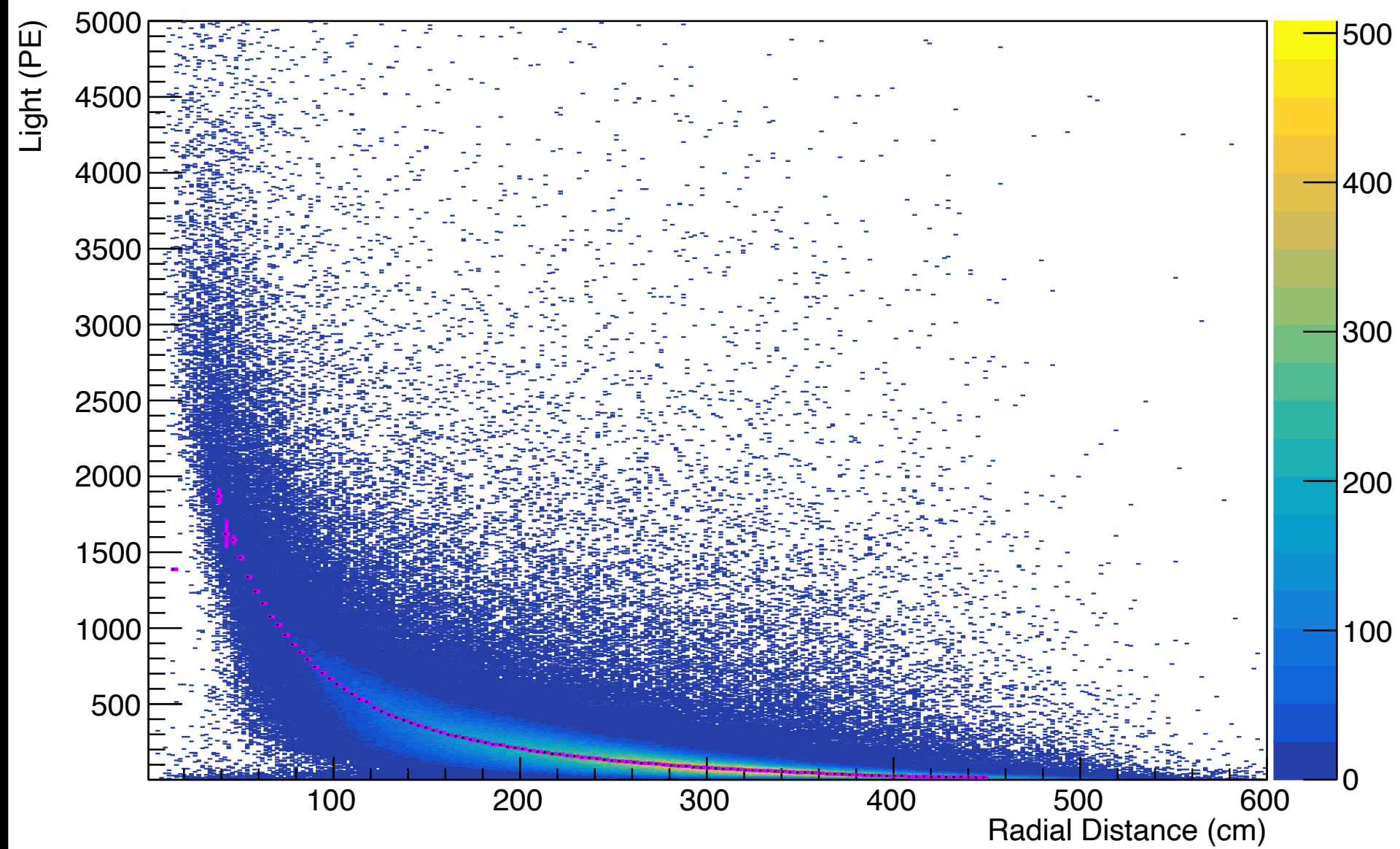
+Xe



# IU DSLG w/ SensL-C1 Attenuation Plots



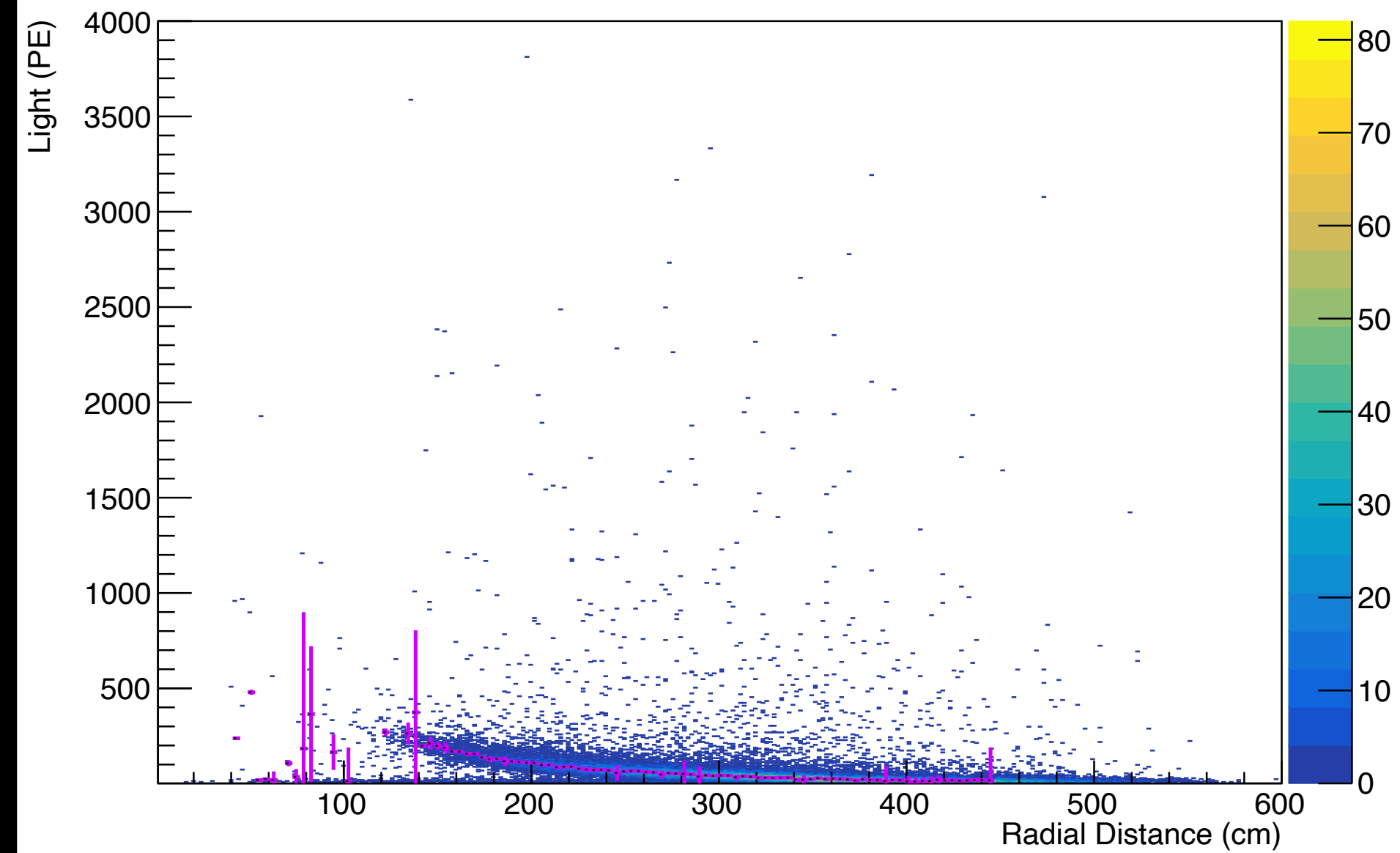
IU Hamamatsu Attenuation in LAr



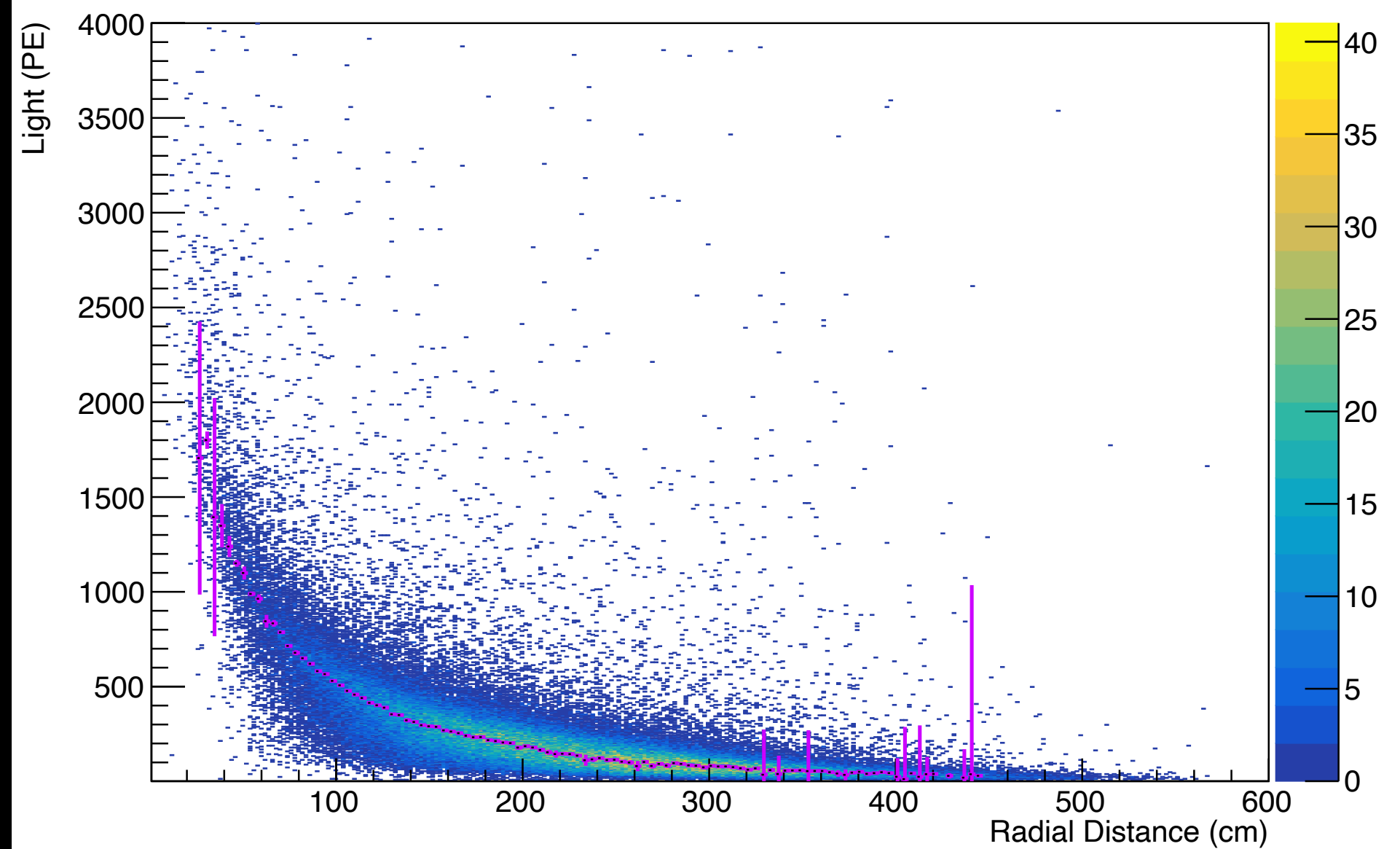
+N



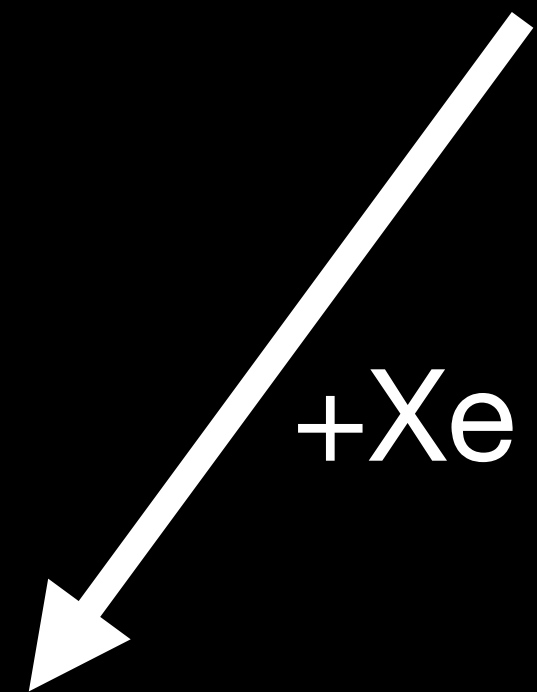
IU Hamamatsu Attenuation in LAr +N



IU Hamamatsu Attenuation in LAr + N + Xe



+Xe



**IU DSLG w/  
Hamamatsu  
Attenuation  
Plots**



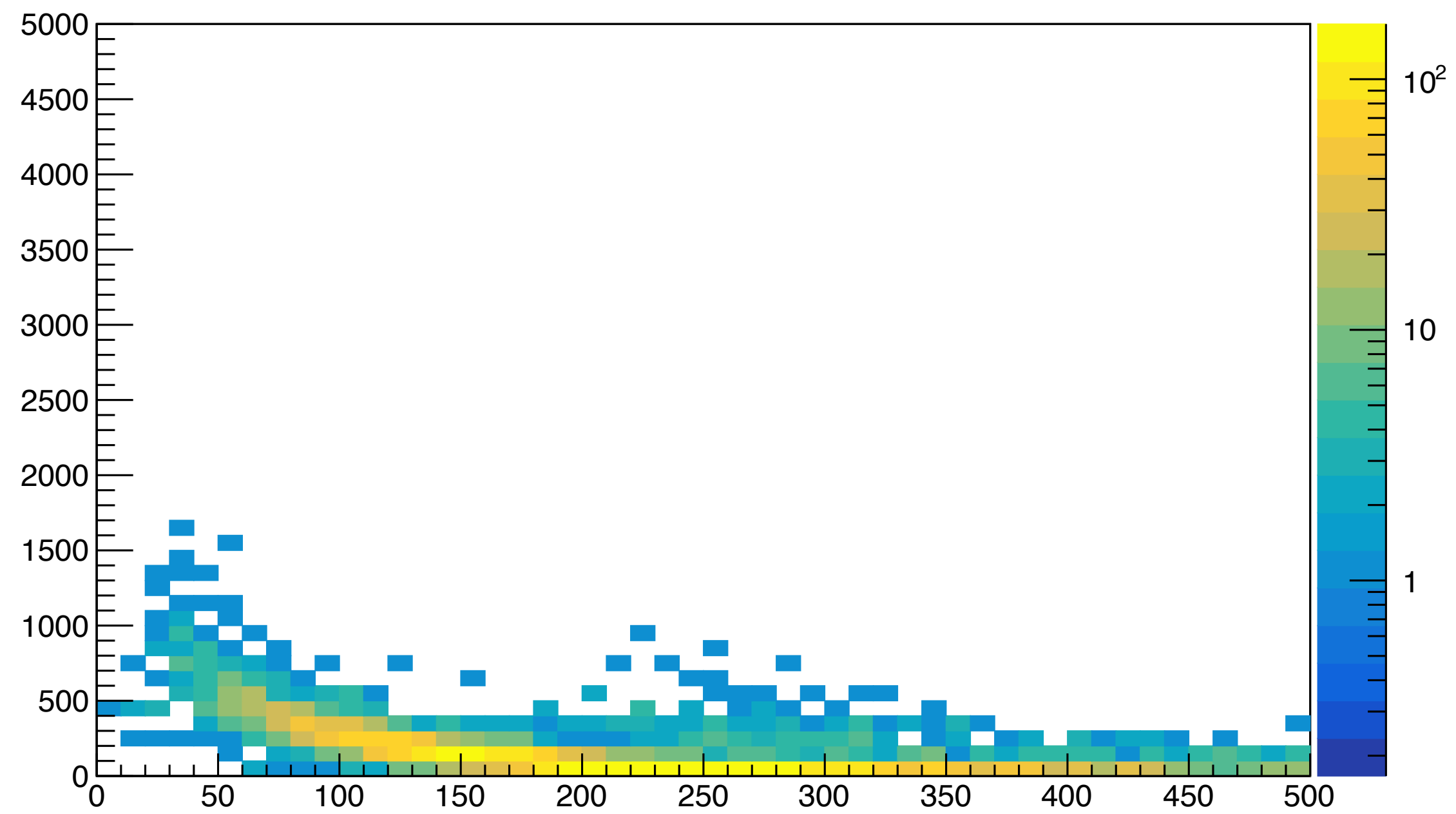
# Update

- Managed to generate Light Libraries
  - Had issue with Voxel numbering / matching
  - Worked out now!
- Generated “standard” 99cm and infinite Rayleigh scattering libraries
  - Initial work / poc
  - Nitrogen and Xenon libraries next
- Generated 5000 MC samples of both and performed attenuation study

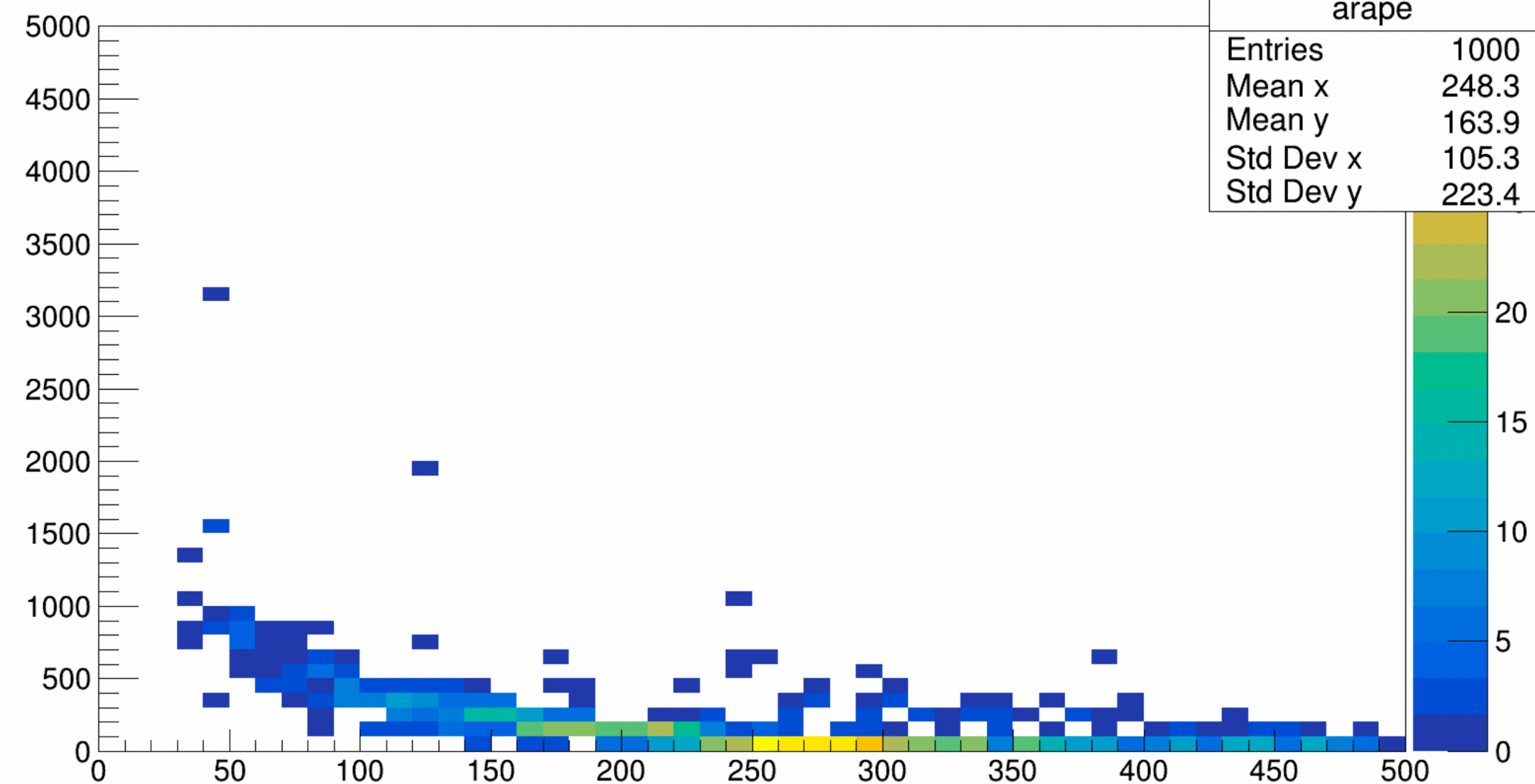
# Update

- Monte Carlo tracks generated with position/momentum from the data tracks
  - Create 1:1 MC to data track
- Run through light reconstruction process
- Transverse distance calculated from true MC start/end position
  - not reconstruction (data uses pandora)
-

arapuca attenuation



arape

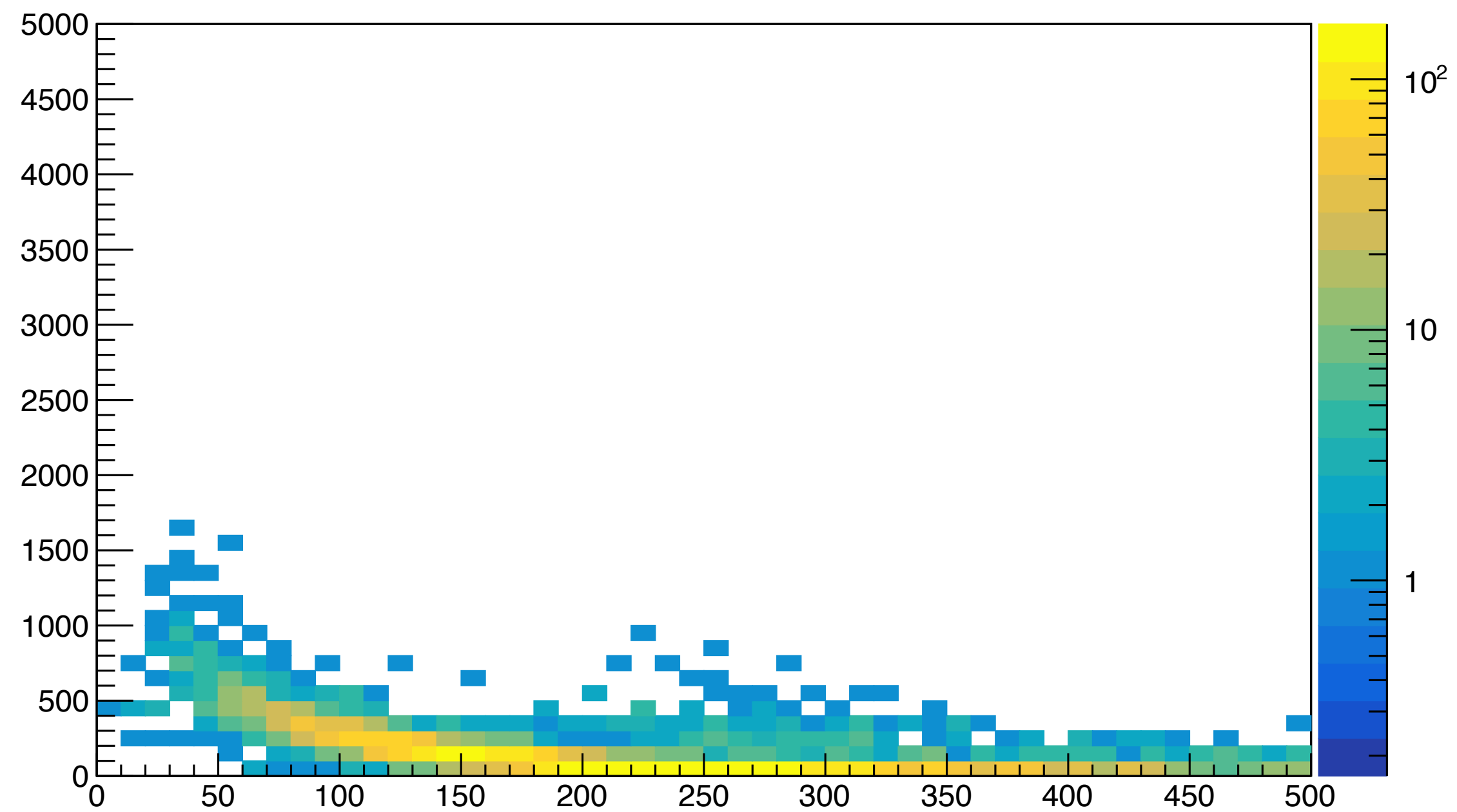


99cm Rayleigh Scattering Monte Carlo

$\approx$

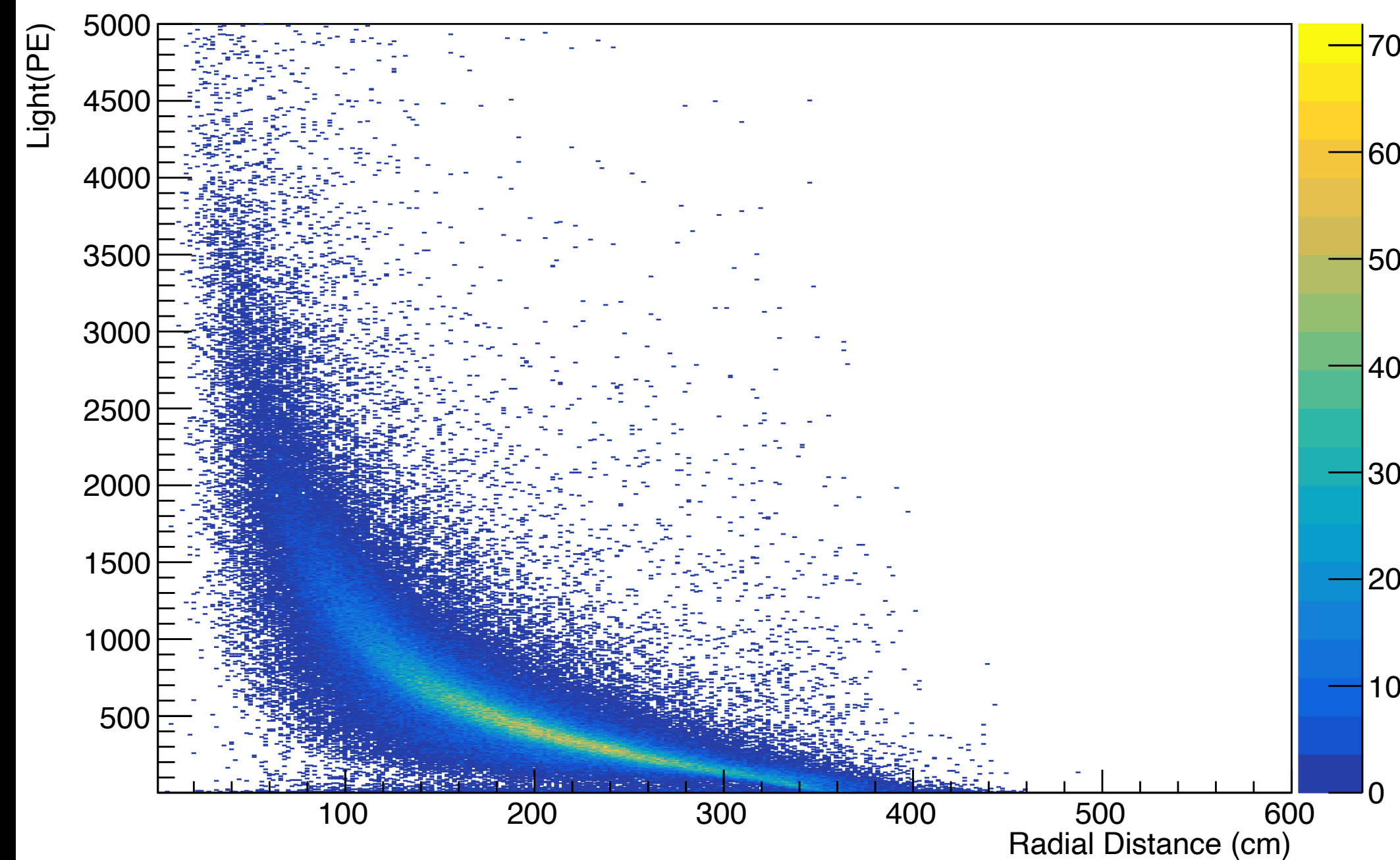
Production Library (1000 events)

arapuca attenuation



99cm Rayleigh Scattering Monte Carlo

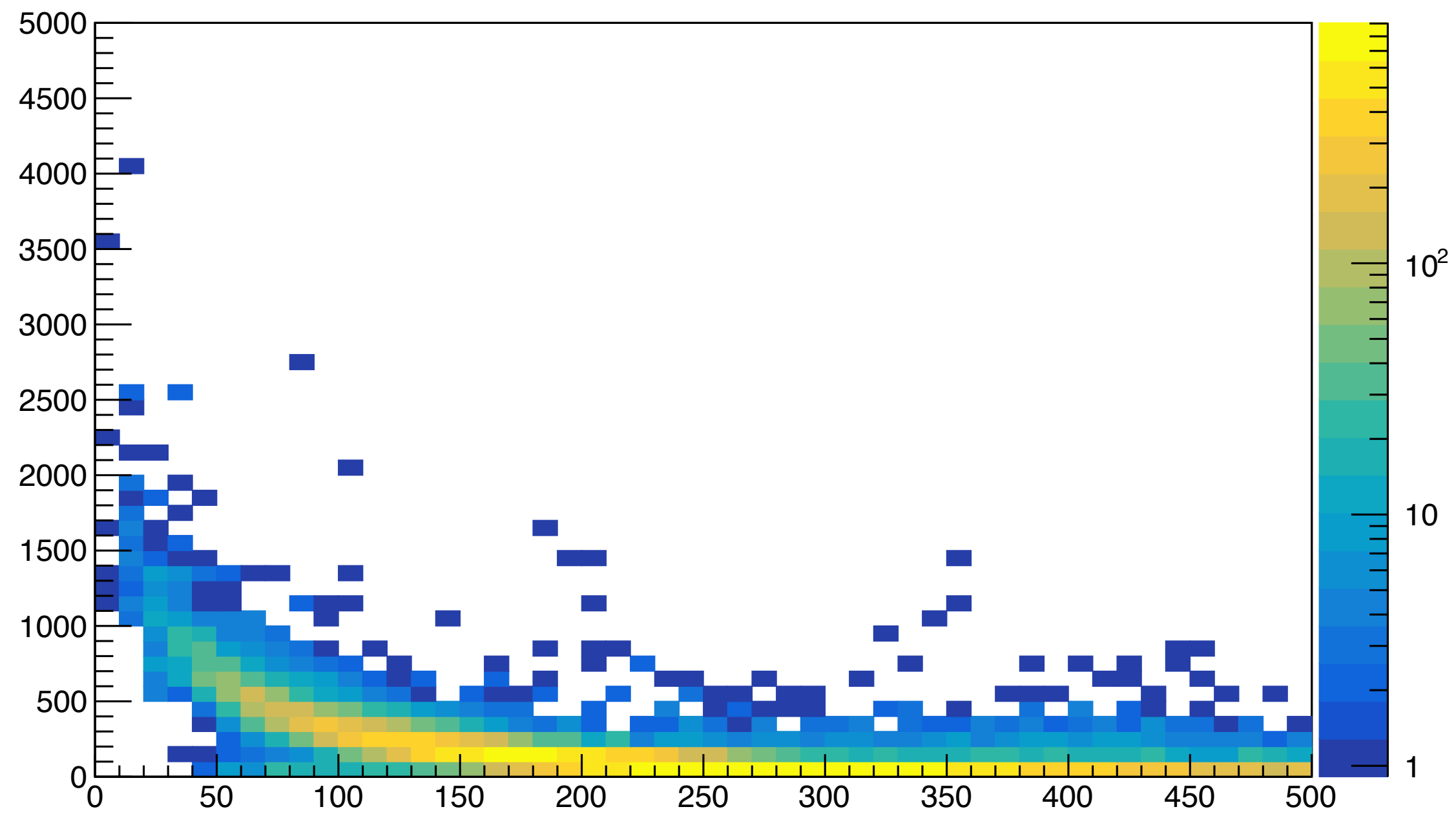
ARAPUCA2\_APA6\_prof



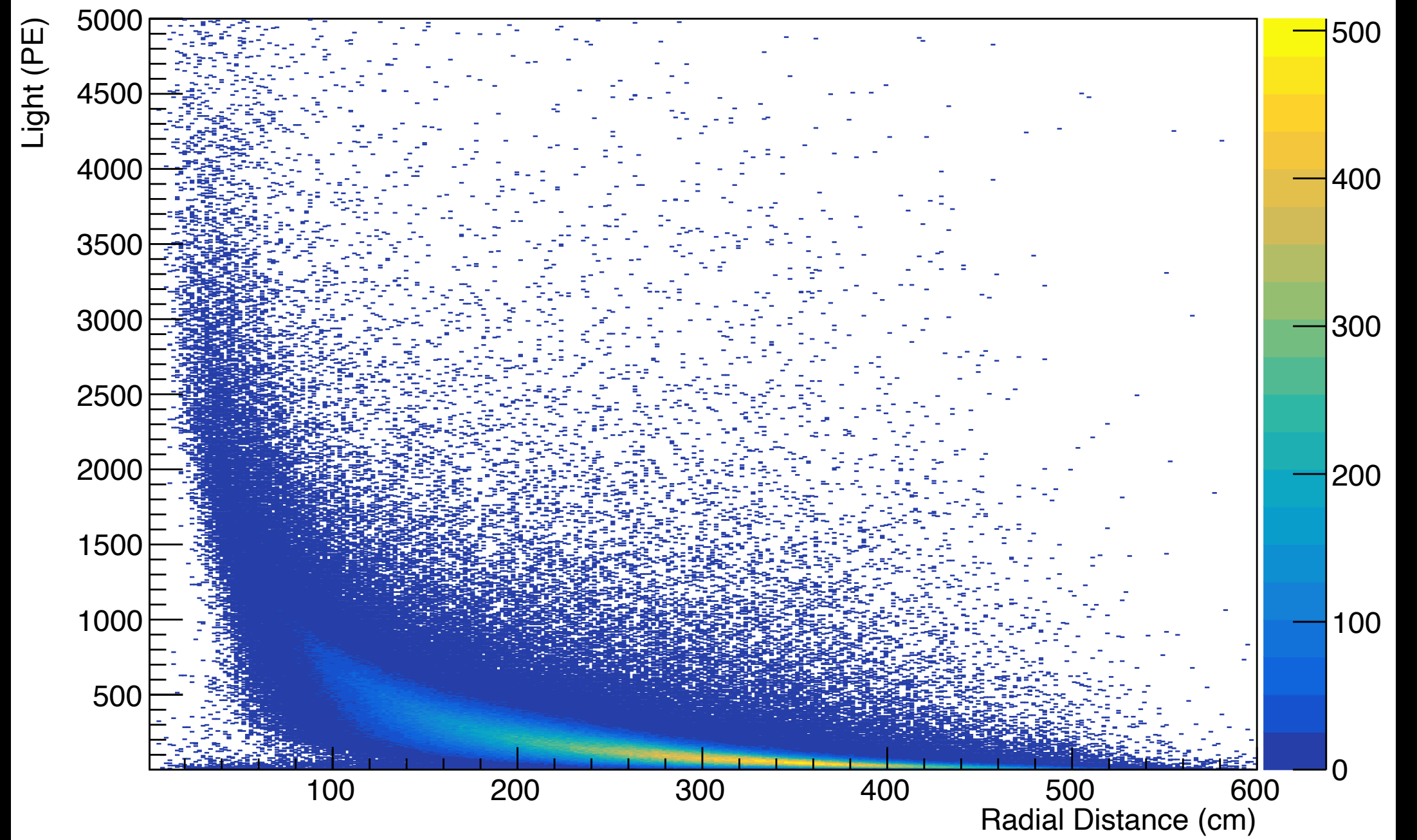
Data



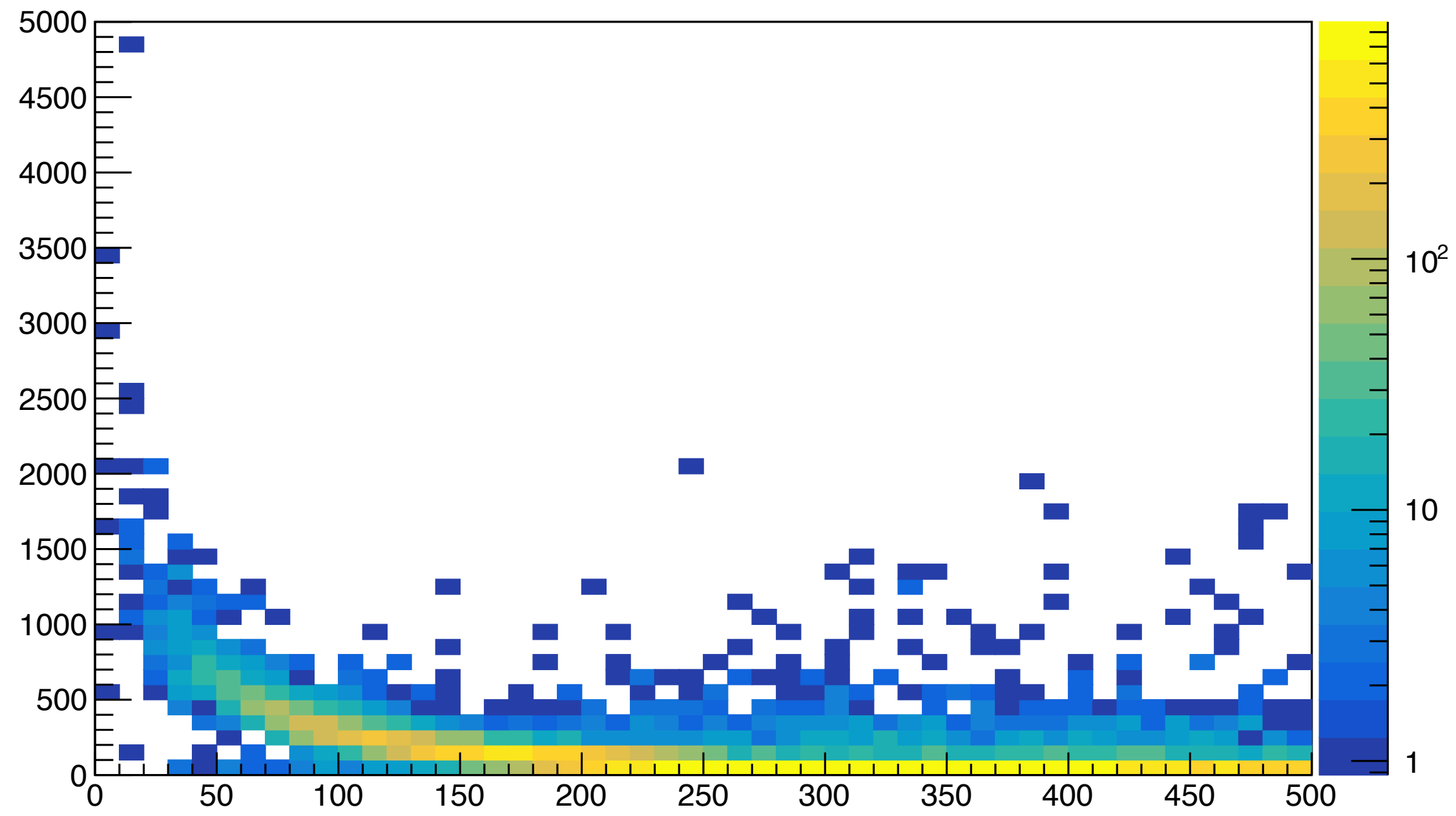
IU bar attenuation - hamamatsu chans



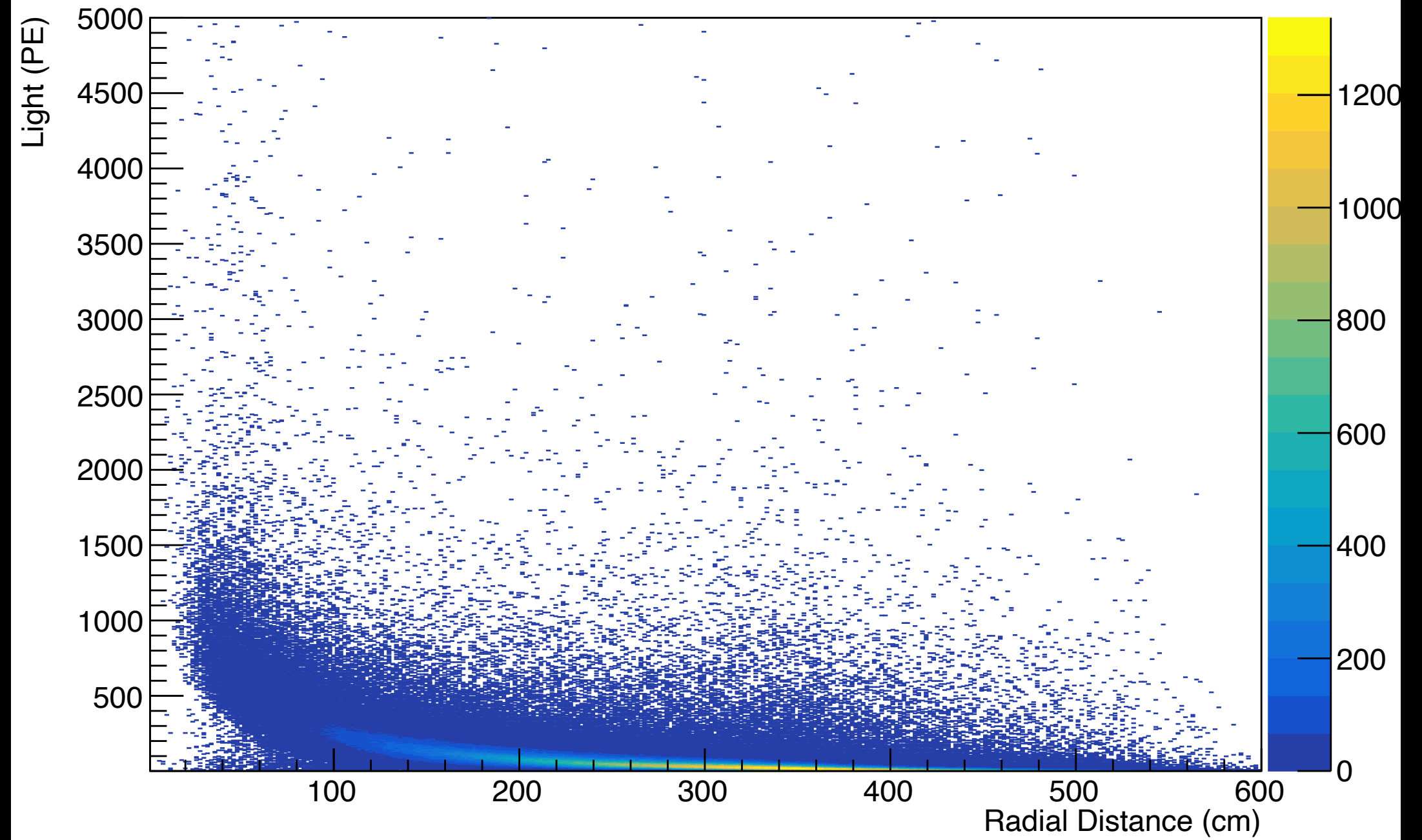
DS\_hamamatsu



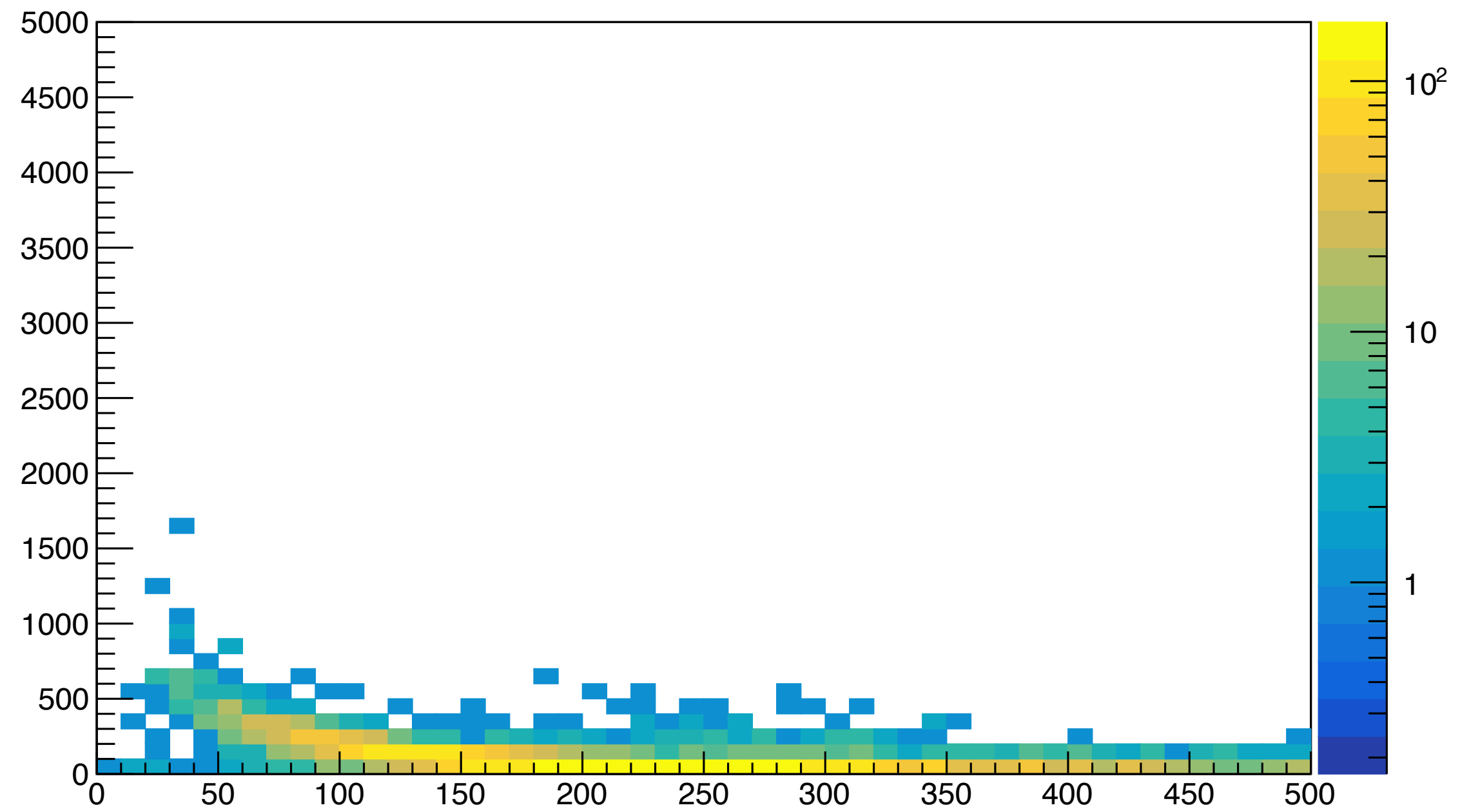
IU bar attenuation - hamamatsu chans



DS\_Sensl\_C1

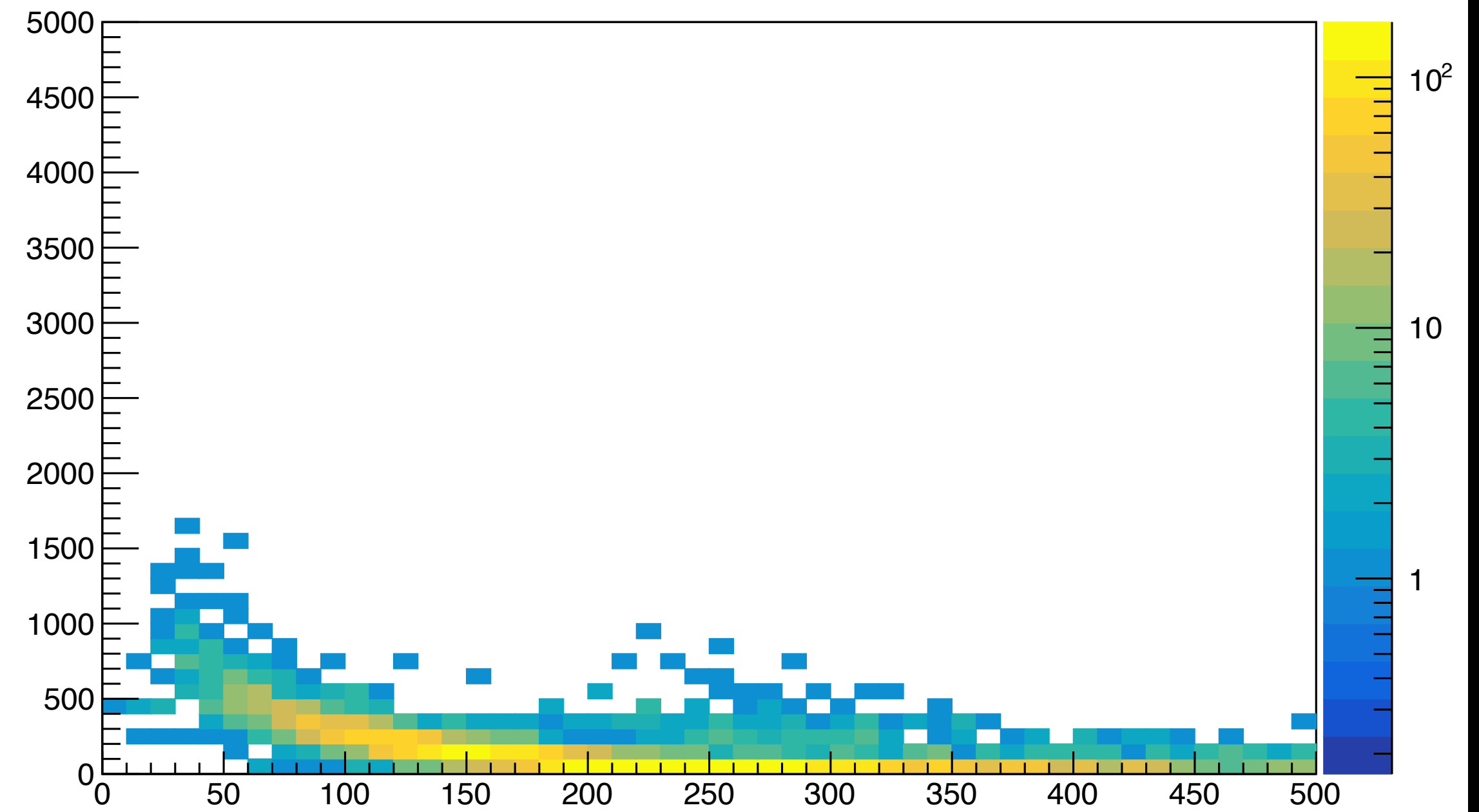


arapuca attenuation



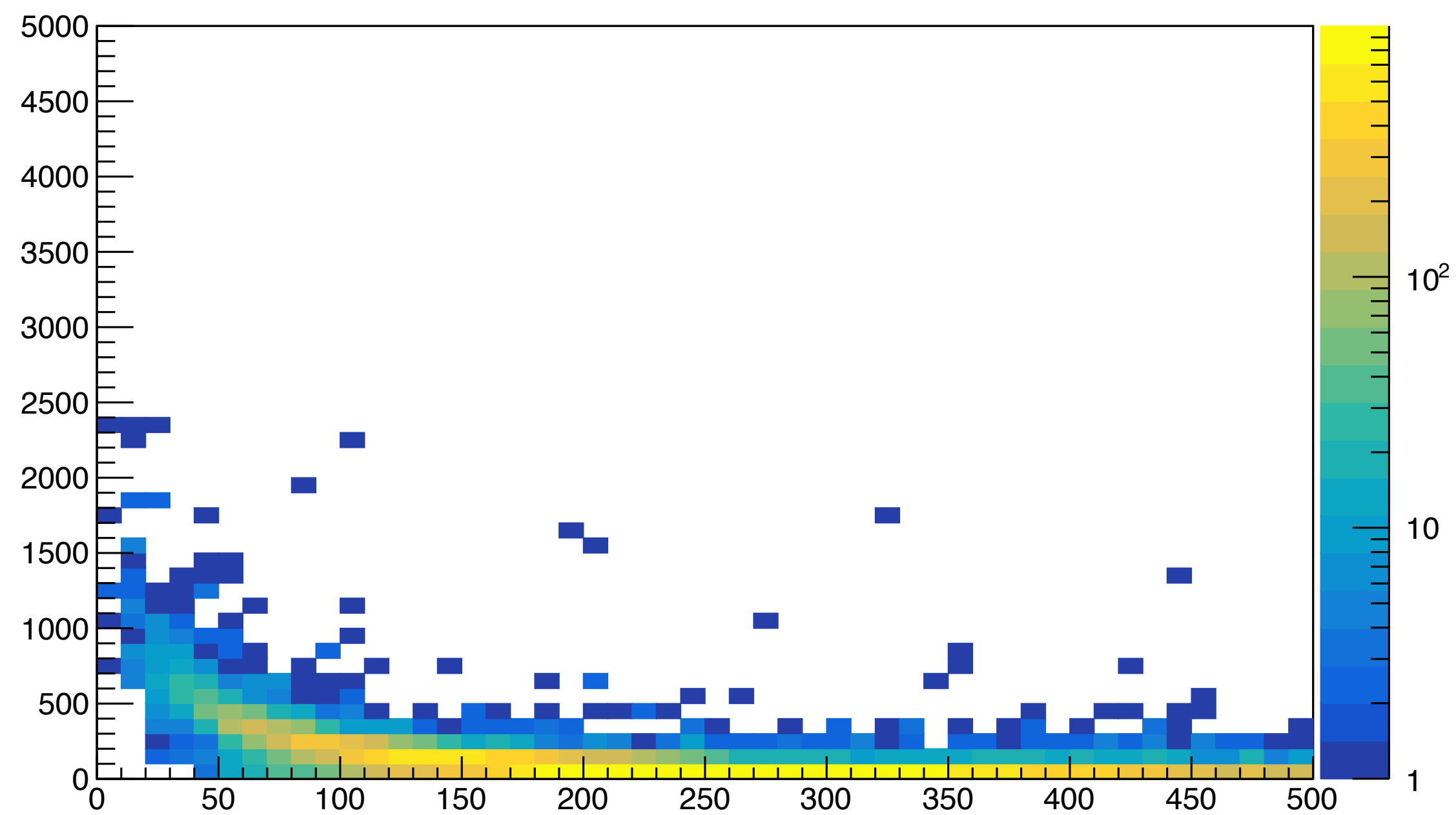
Infinite Rayleigh Scattering  
5000 Events

arapuca attenuation



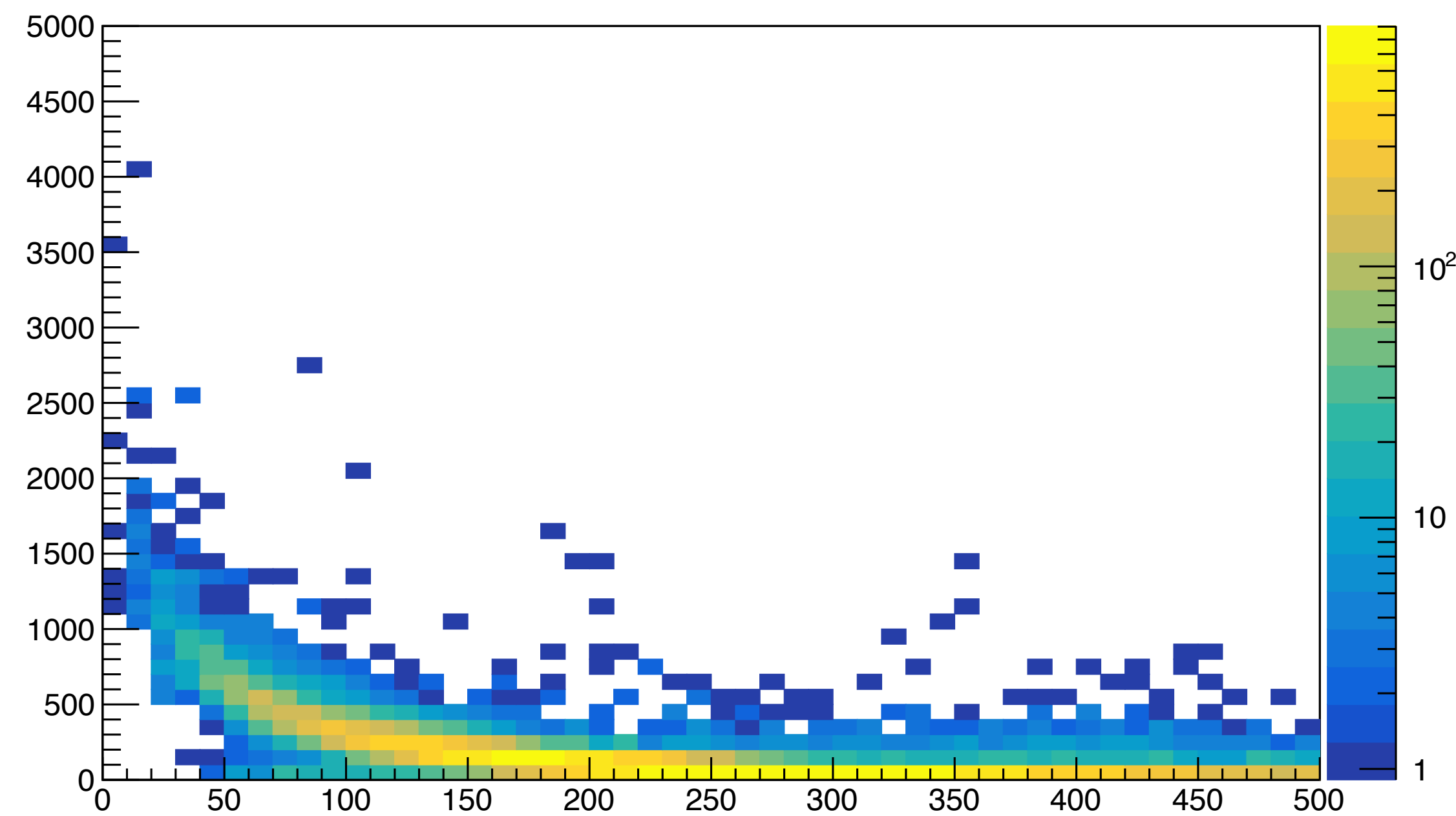
99cm Rayleigh Scattering  
Events

IU bar attenuation - hamamatsu chans



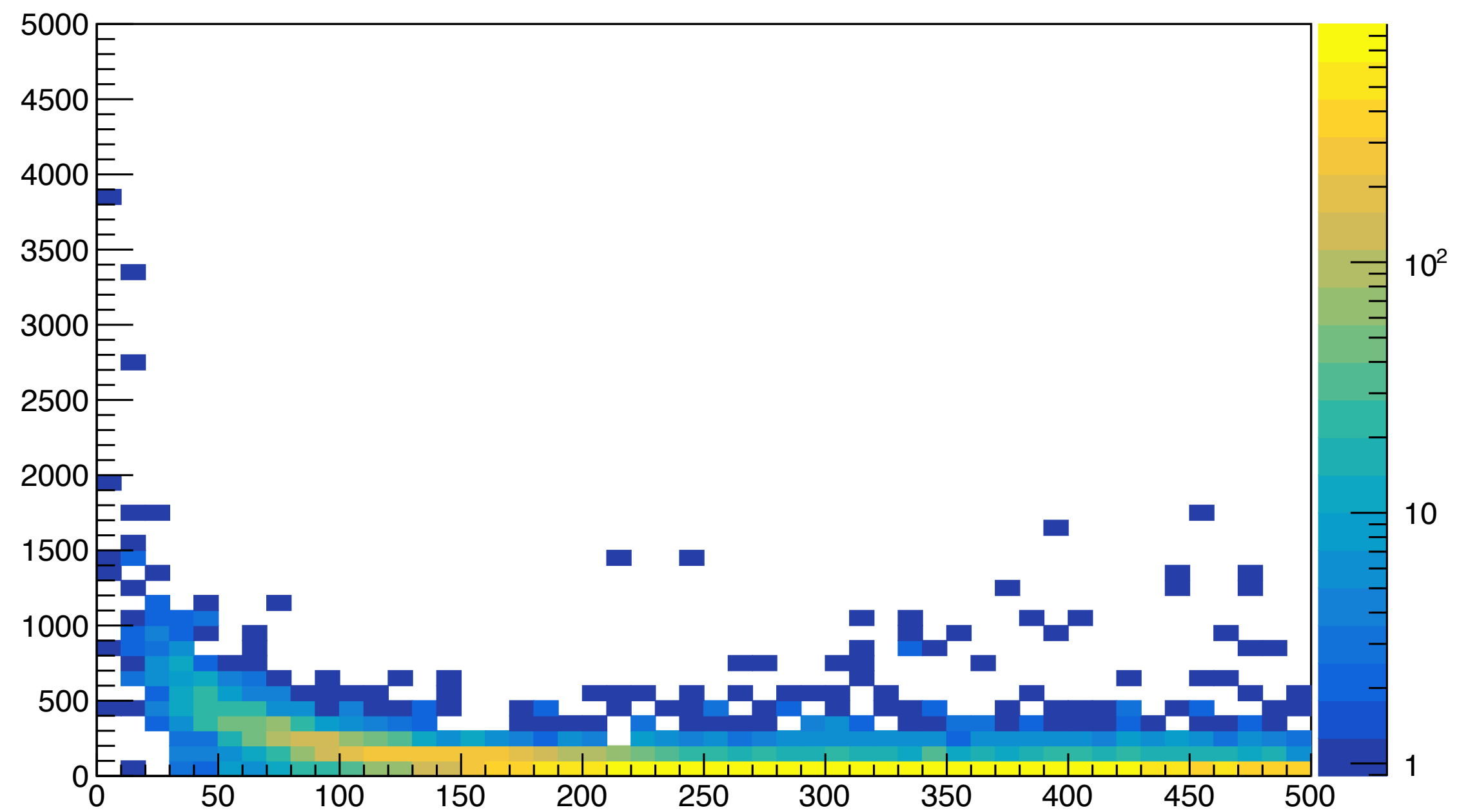
Infinite Rayleigh Scattering

IU bar attenuation - hamamatsu chans



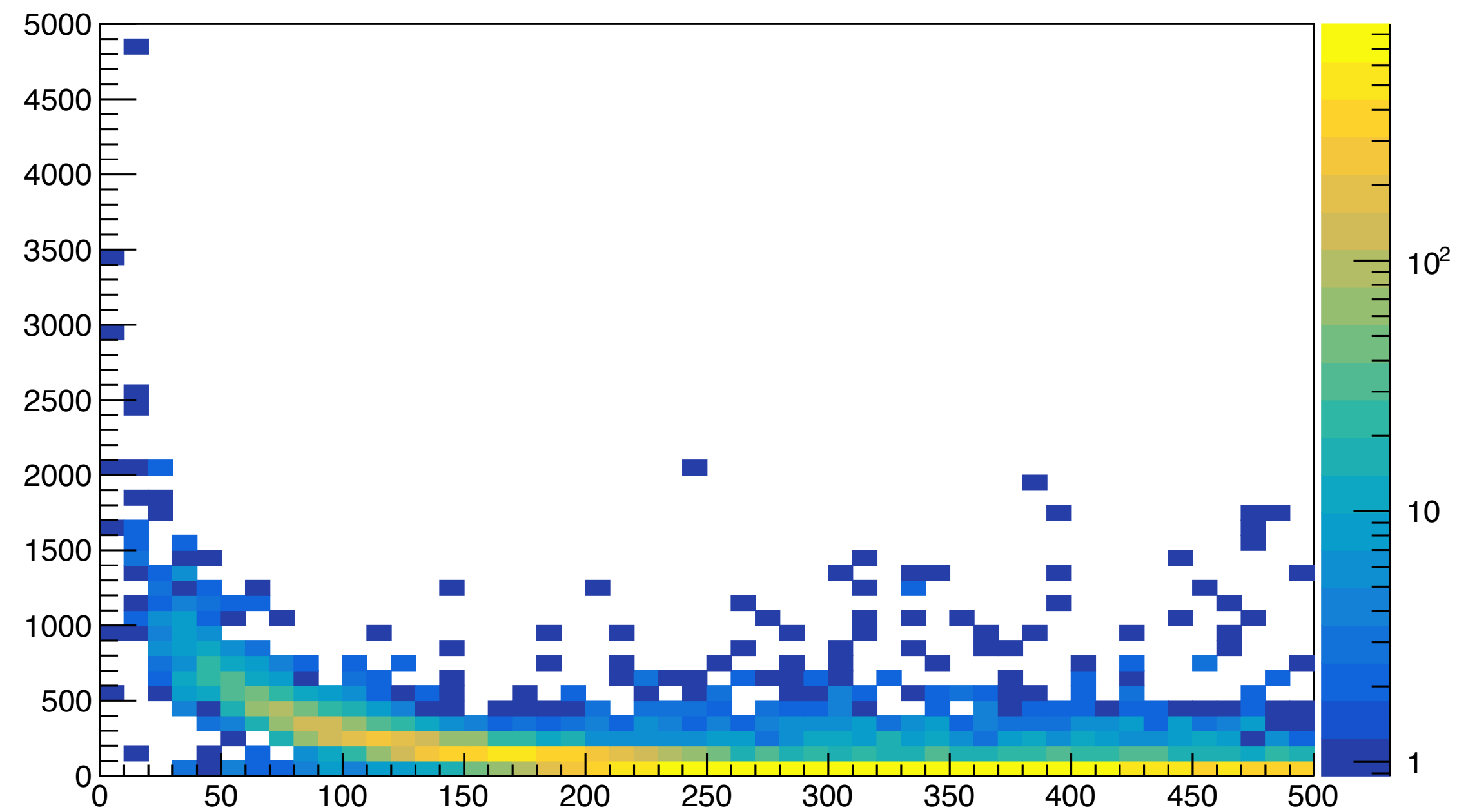
99cm Rayleigh Scattering

IU bar attenuation - hamamatsu chans



Infinite Rayleigh Scattering

IU bar attenuation - hamamatsu chans



99cm Rayleigh Scattering

# Conclusions

- Initial studies show new library comparable to production library
- (Effectively) Infinite Rayleigh scattering library shows less light collected
  - ?
- Nitrogen Libraries in production now (read: next week)

