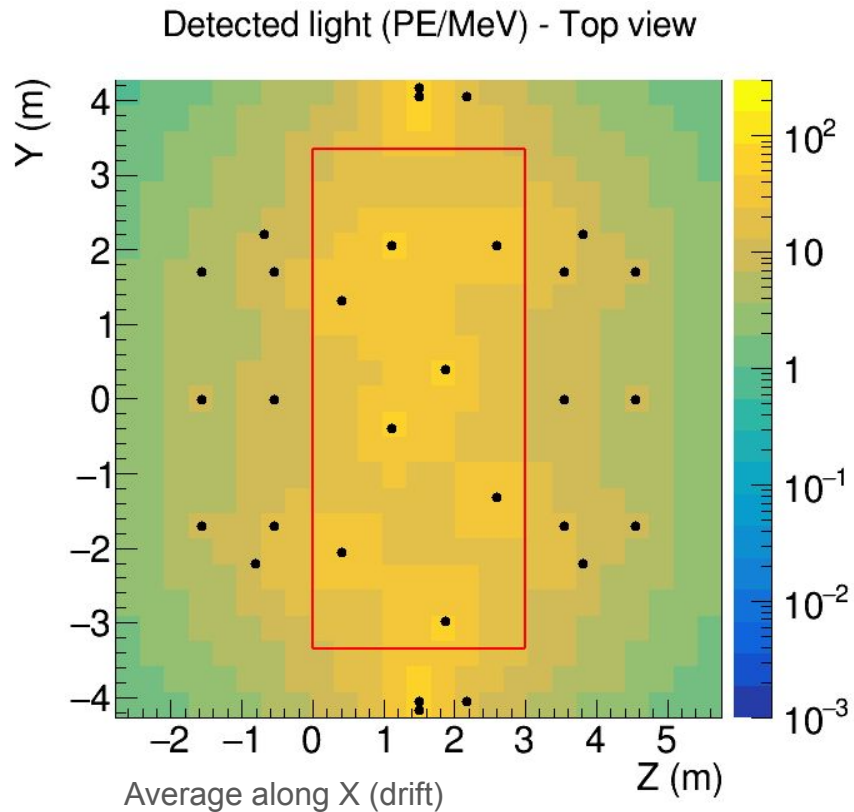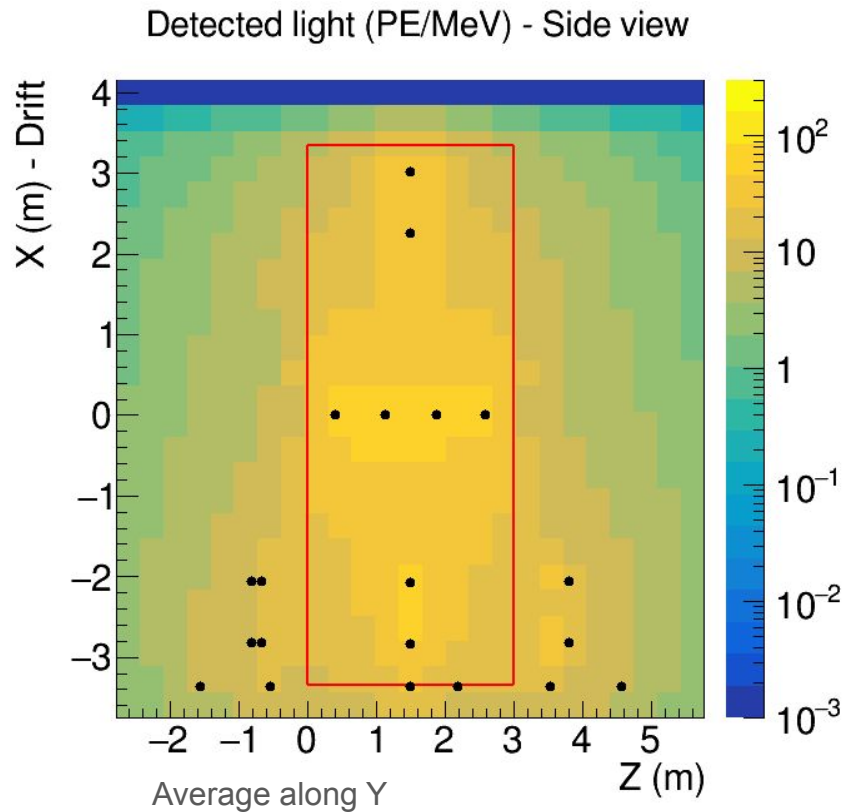# Photon libraries for the ProtoDUNEs

J. Soto

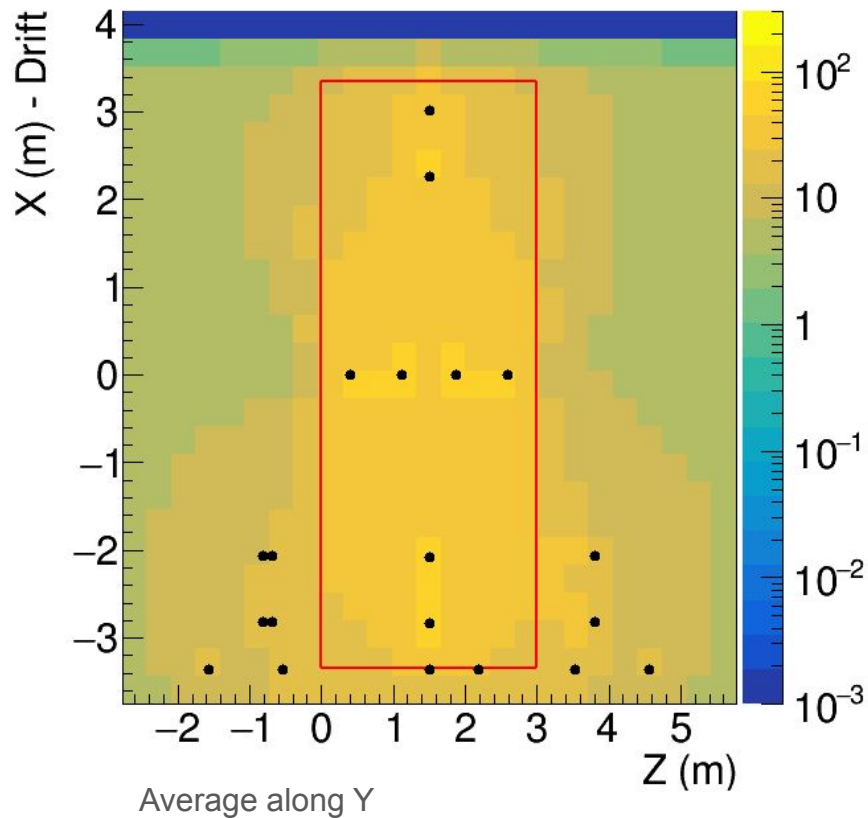# Photon libraries for ProtoDUNE-VH and HD

- Using the new geometries (v4 for VD and v6 for HD).
- Reflectivities are included.
- 1m RSL + 20m AL for 128 nm.
- 8m RSL + 80m AL for 175 nm.
- 25 x 25 x25 voxels - Voxel size ~25x30x30cm
- 5e7 photos per voxel generated.
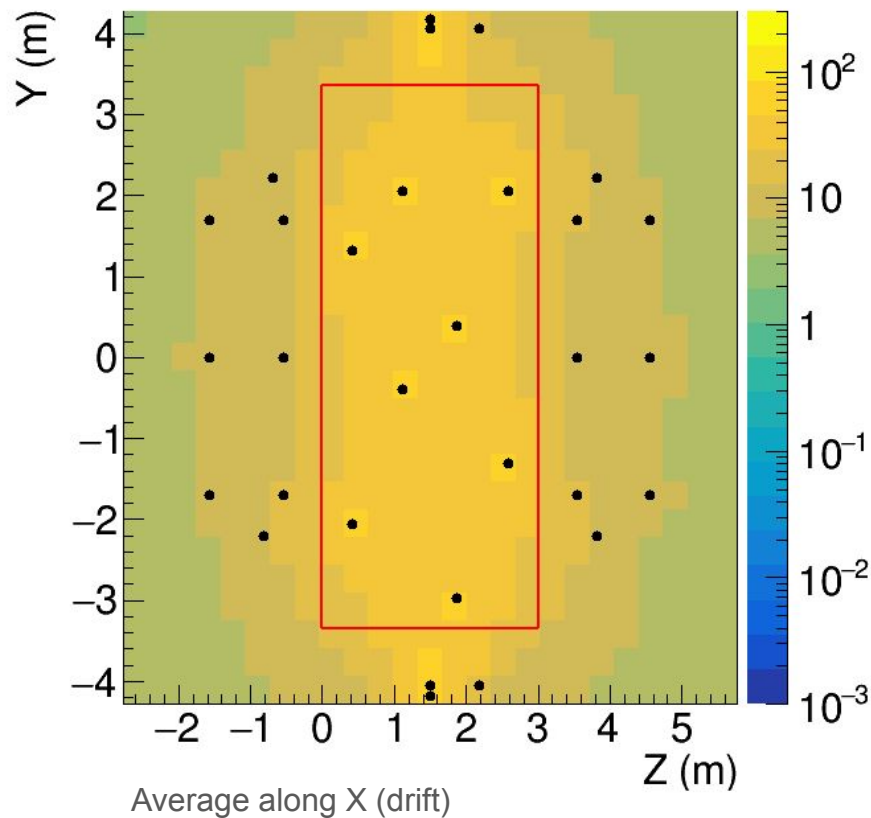
ProtoDUNE-VD photon libraries (Ar)

Detected light (PE/MeV) - Side view

Detected light (PE/MeV) - Top view

Average along Y

Average along X (drift)

ProtoDUNE VD (Xe)

Detected light (PE/MeV) - Side view

Average along Y

Detected light (PE/MeV) - Top view
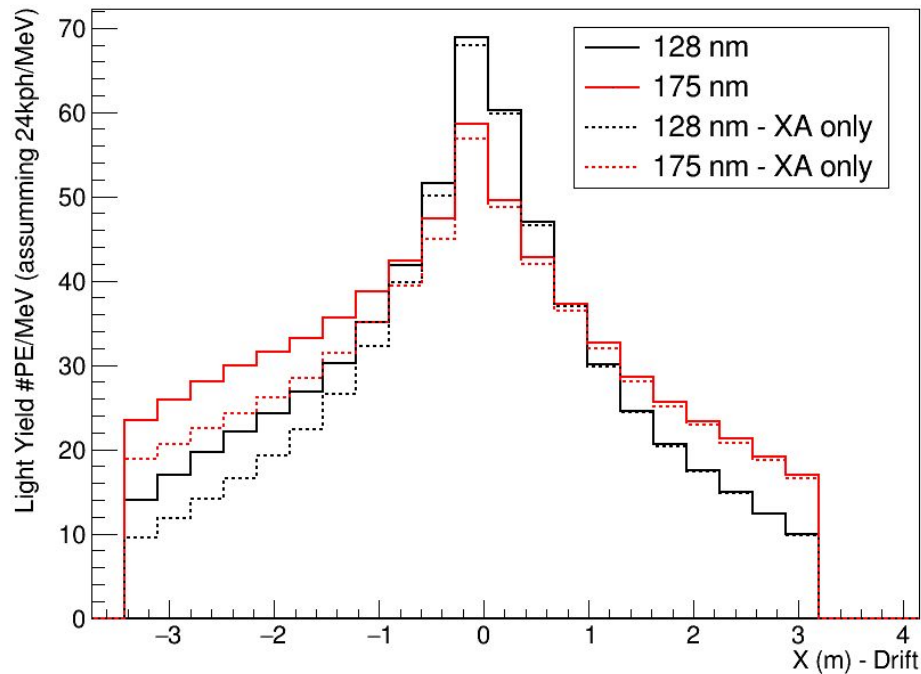
Average along X (drift)

ProtoDUNE-VD average light yields

Light yields considering 24k photons per MeV and a QE of 0.03 for XAs.

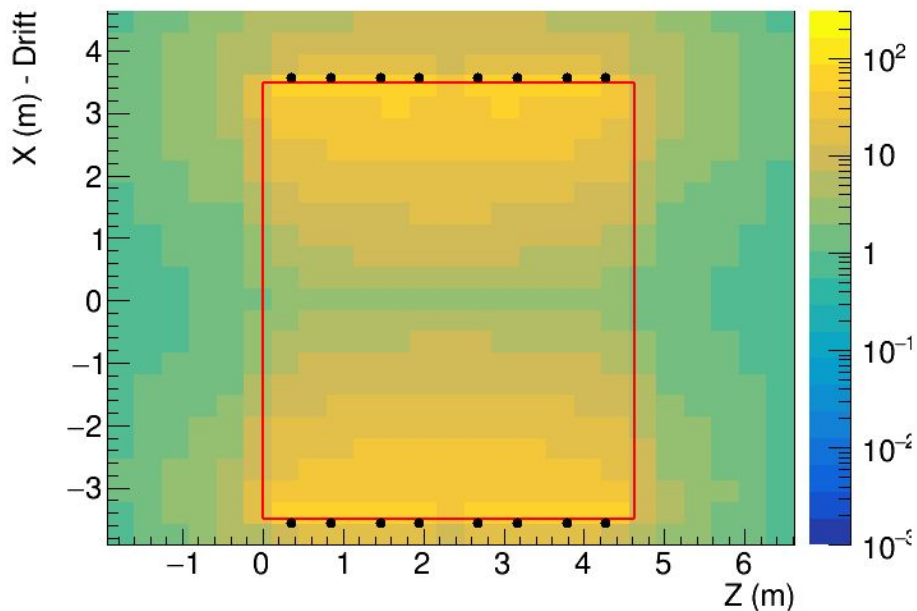|	Ar light (PE/MeV)		Xe light (PE/MeV)	
	Active Volume	All Volume	Active Volume	All Volume
All detectors	29.4	12.7	32.6	15.4
XA only	27.7	10.8	30.5	13.1
PMTs only	1.7	2.0	2.1	2.3

ProtoDUNE-vD photon libraries

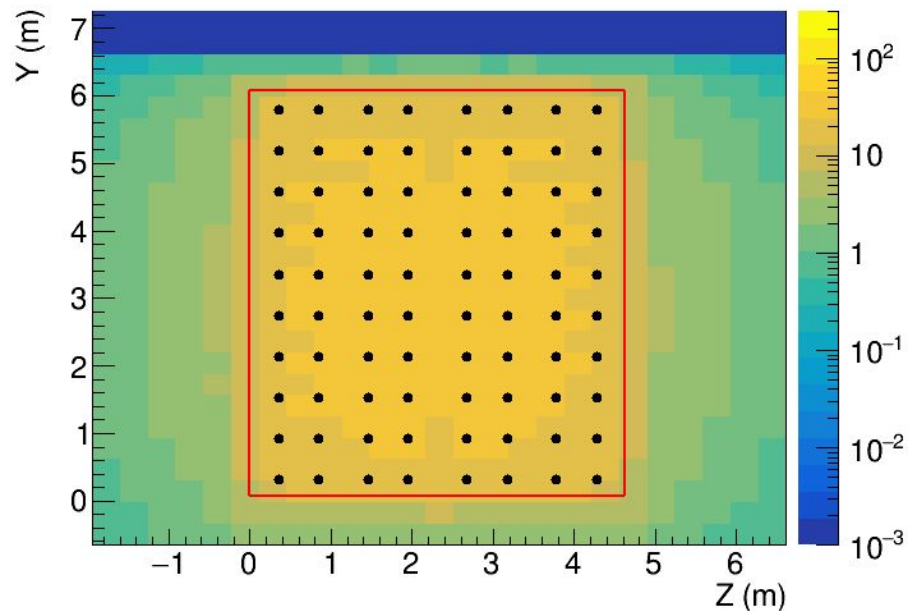Average over AV

Average over all volume

ProtoDUNE-HD photon libraries (Ar)

Detected light (PE/MeV)   Top view

Detected light (PE/MeV) - Side view

Average along Y

Average along X (drift)

ProtoDUNE-HD

Light yields considering 24k photons per MeV and a QE of 0.03 for XAs.

	Ar light (PE/MeV)	
	Active Volume	All Volume
All detectors	25.9	11.0