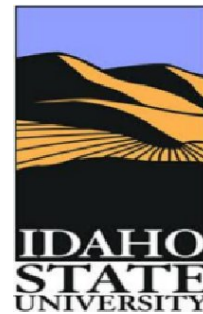
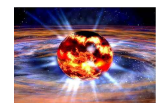


# ISU SAM Work

Dustin McNulty  
Idaho State University  
*mcnulty@jlab.org*

Nov 11 - 12, 2018

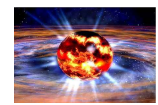




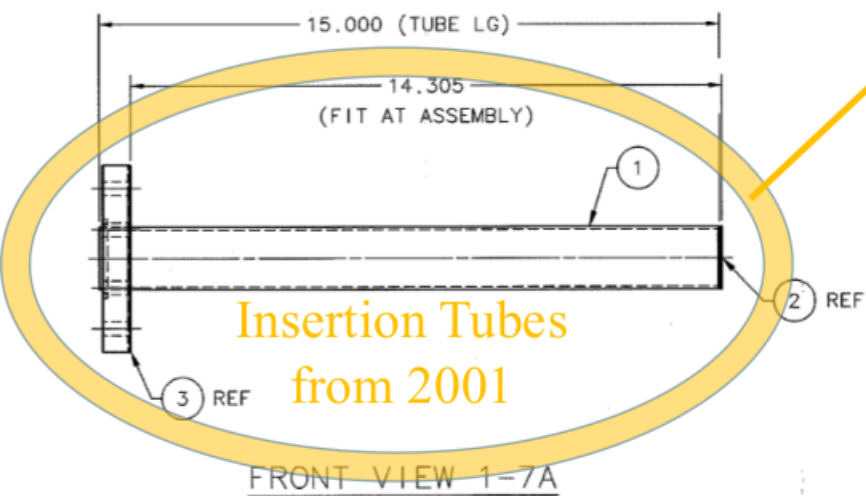
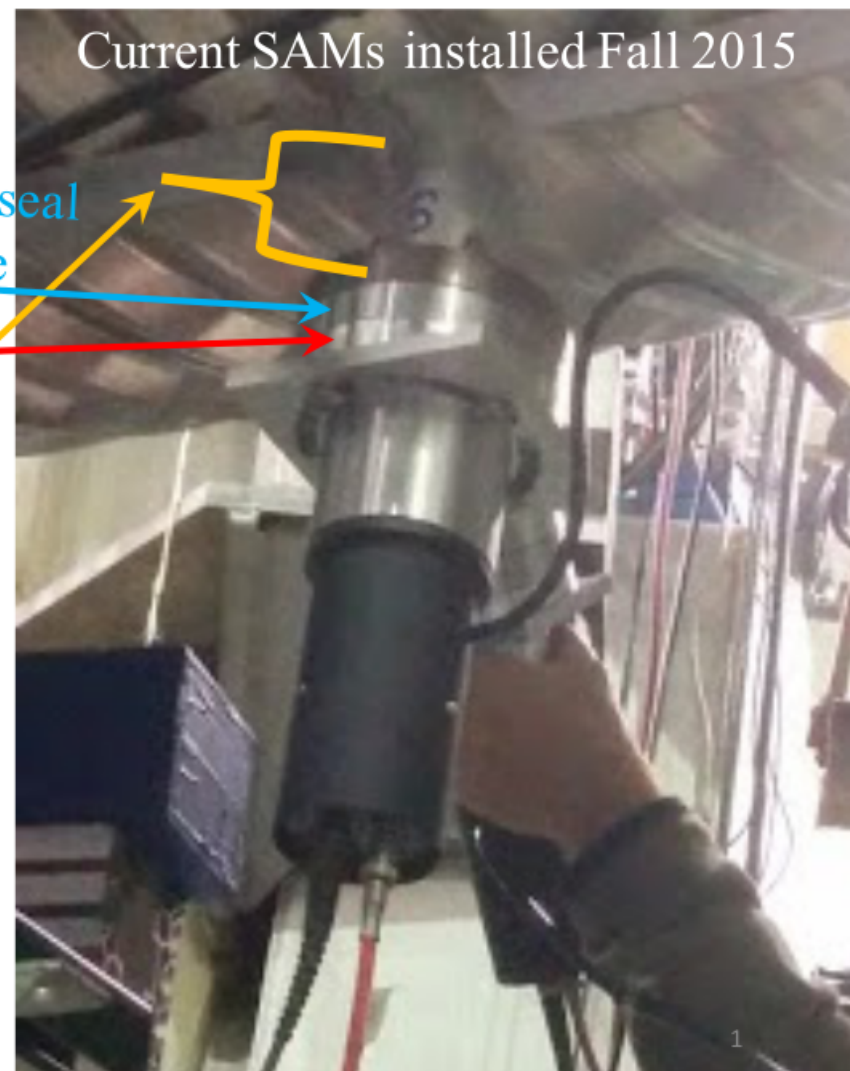
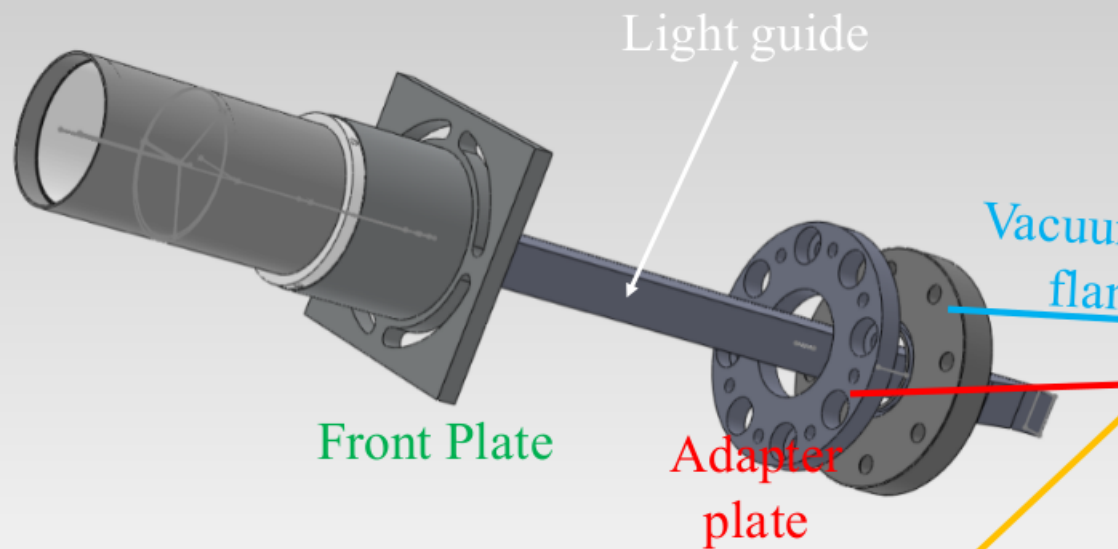
## ISU SAM Work

### Talk Outline:

- New quartz, light guide, and vacuum insertion tube geometries
- Simulated light yields for new design
- SLAC Testbeam for SAMs
- Summary

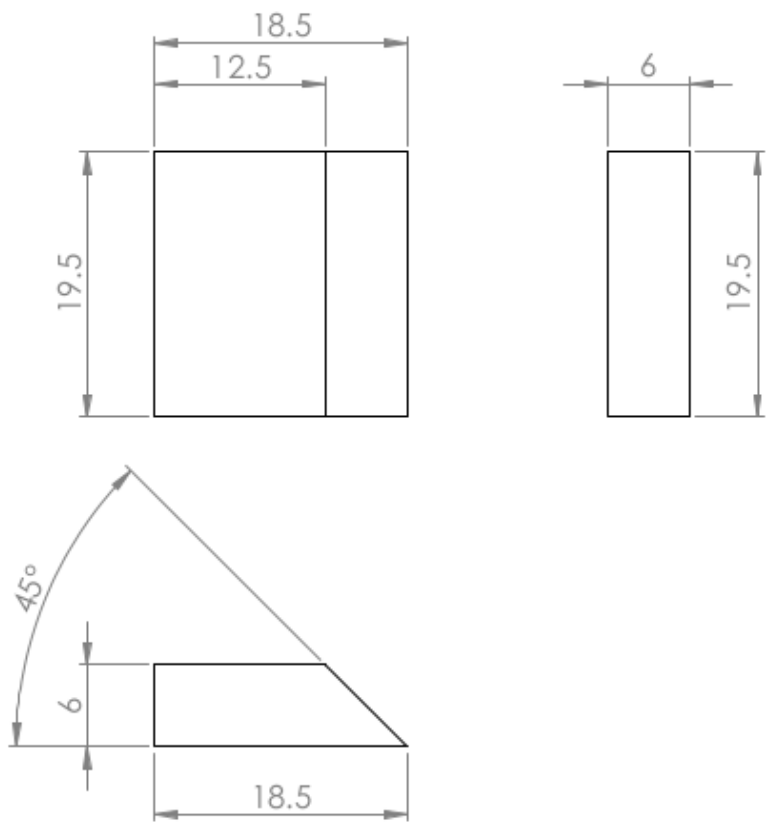


## SAMs currently installed (since Dec 2015)

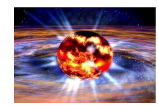




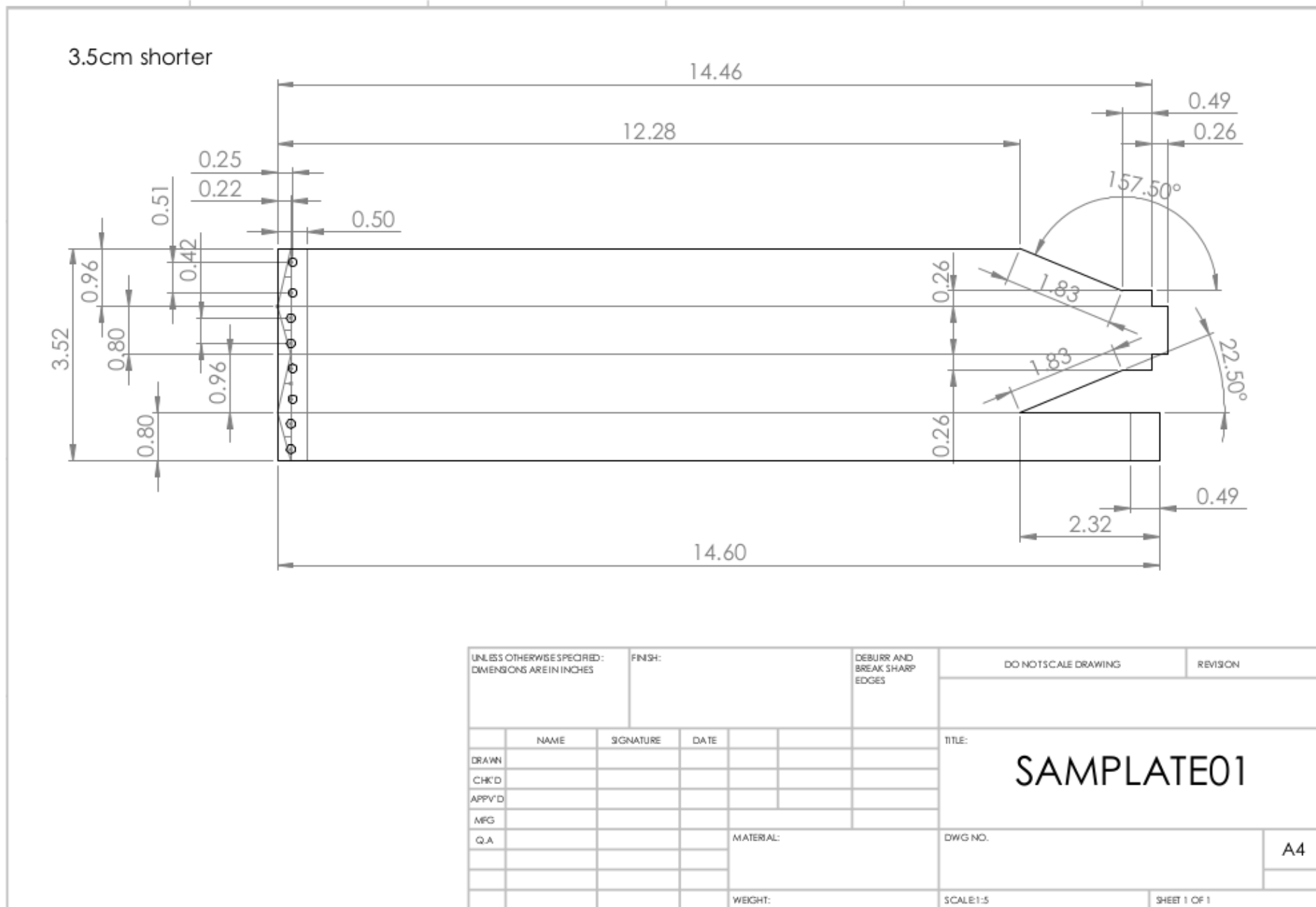
## New SAM quartz: thinner and shorter

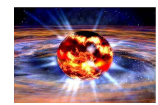


UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:				FINISH:		DEBURR AND BREAK SHARP EDGES		DO NOT SCALE DRAWING		REVISION			
								TITLE:  <b>quartz_SAM</b>					
DRAWN				NAME		SIGNATURE						DATE	
CHKD													
APPVD													
MFG													
Q.A						MATERIAL:		DWG NO.					
								A4					
						WEIGHT:		SCALE:2:1 SHEET 1 OF 1					

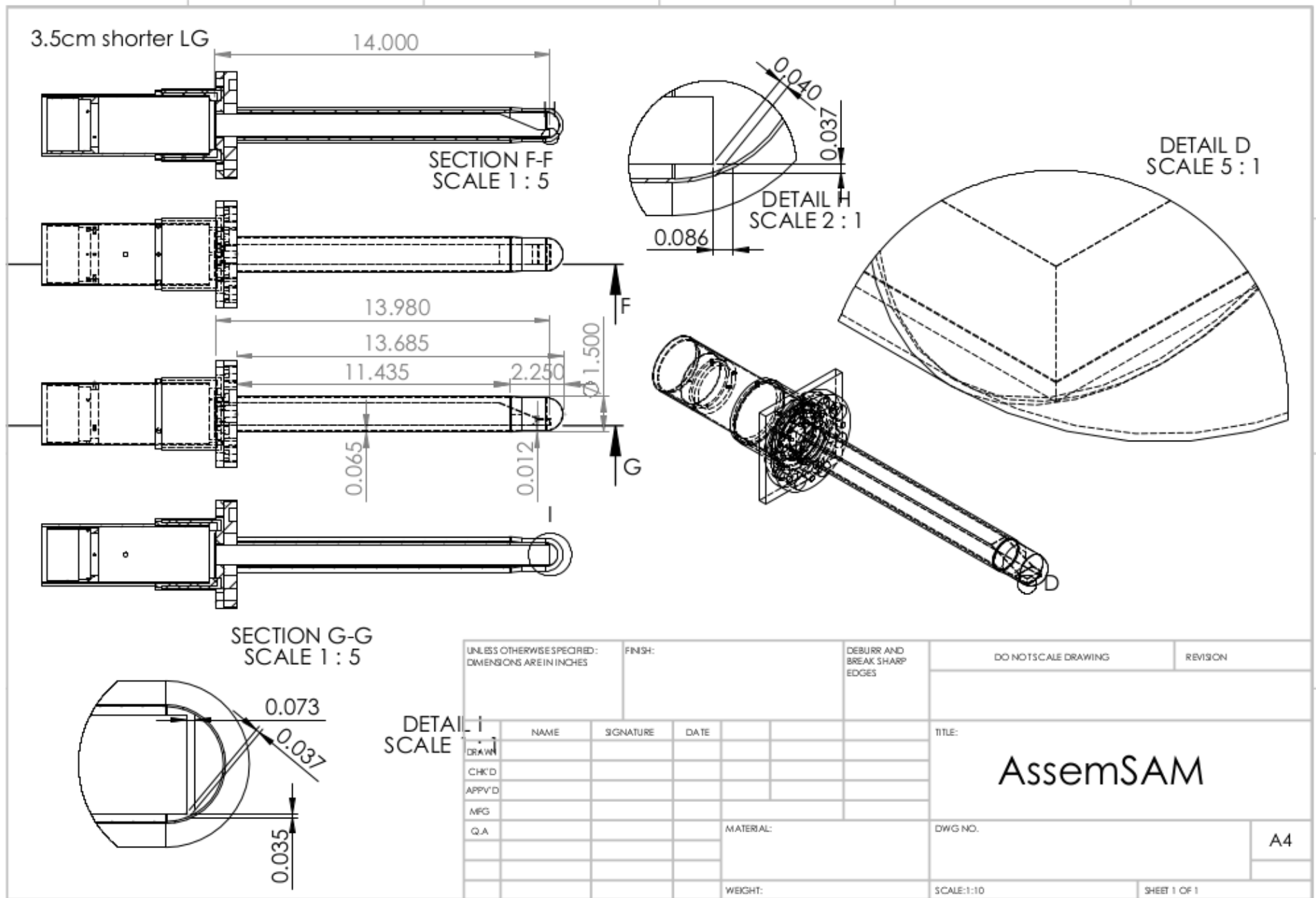


## New SAM LG: 3.5 cm shorter, redesigned





## New Vacuum Tubes—shorter; spherical endcap





## New SAM LG: Shorter by 3.5 cm and optimized funnel angle

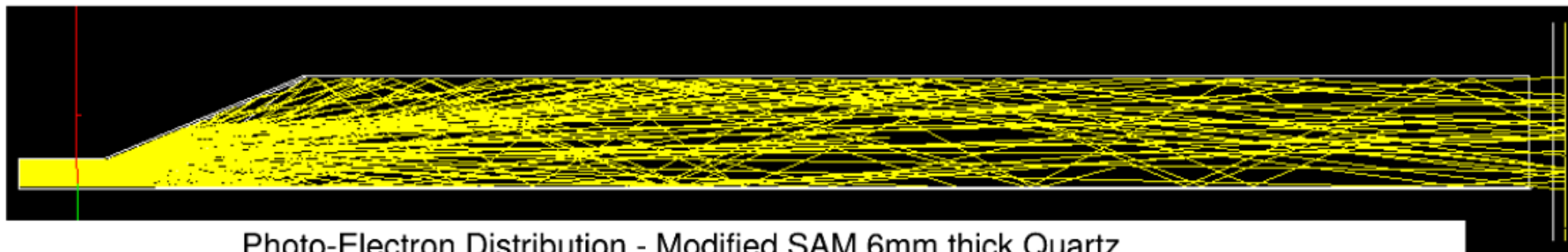
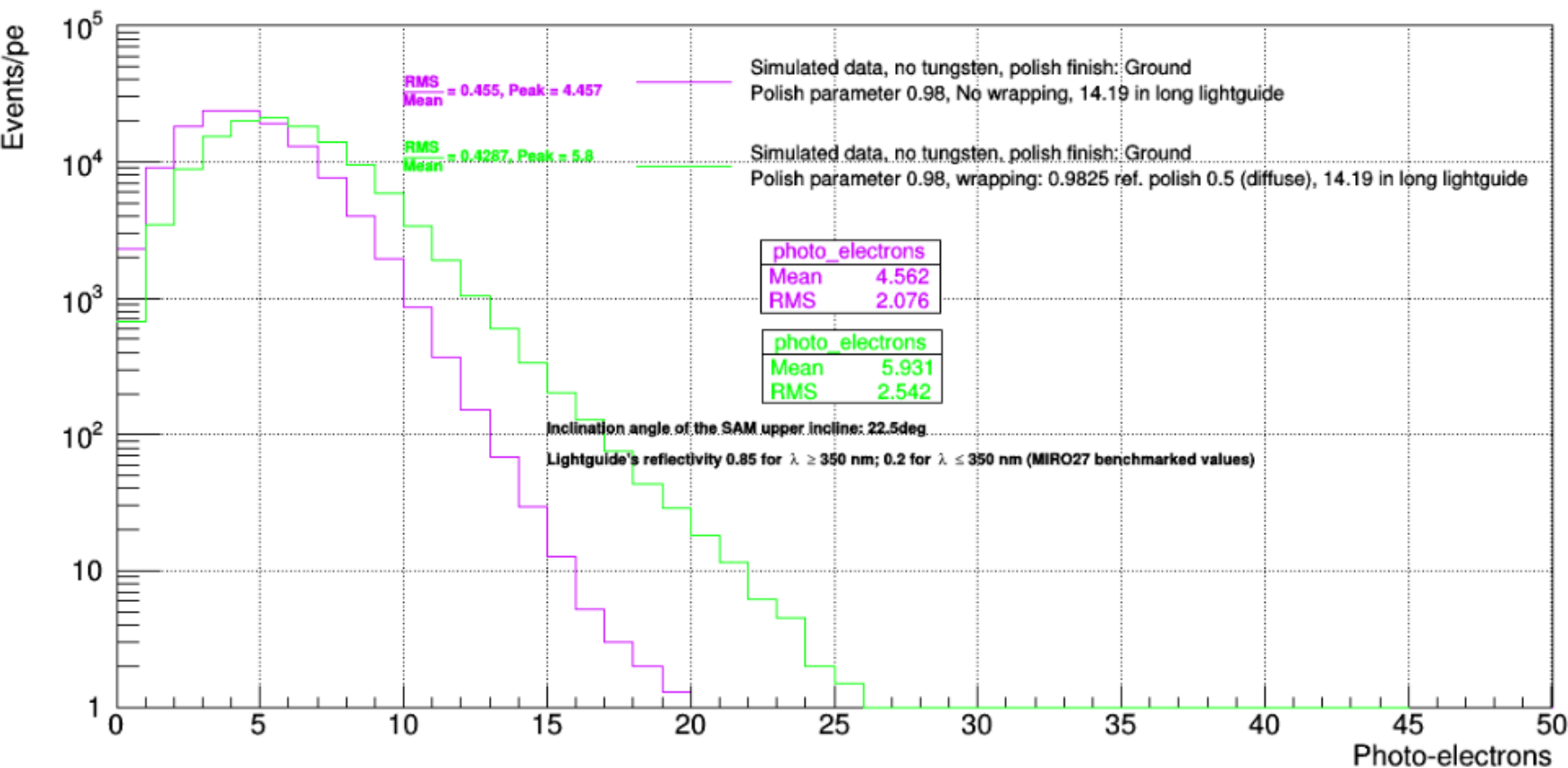
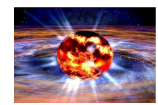


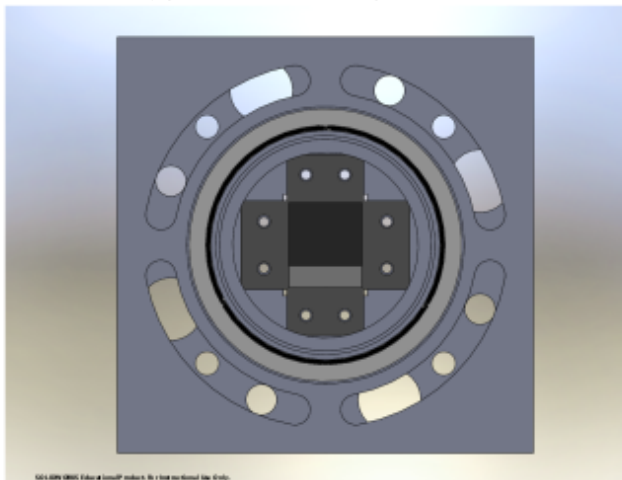
Photo-Electron Distribution - Modified SAM 6mm thick Quartz



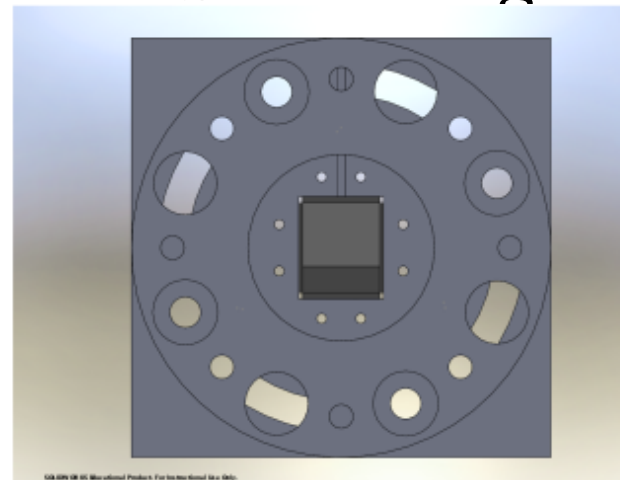
About 6 PEs per electron with 43% resolution



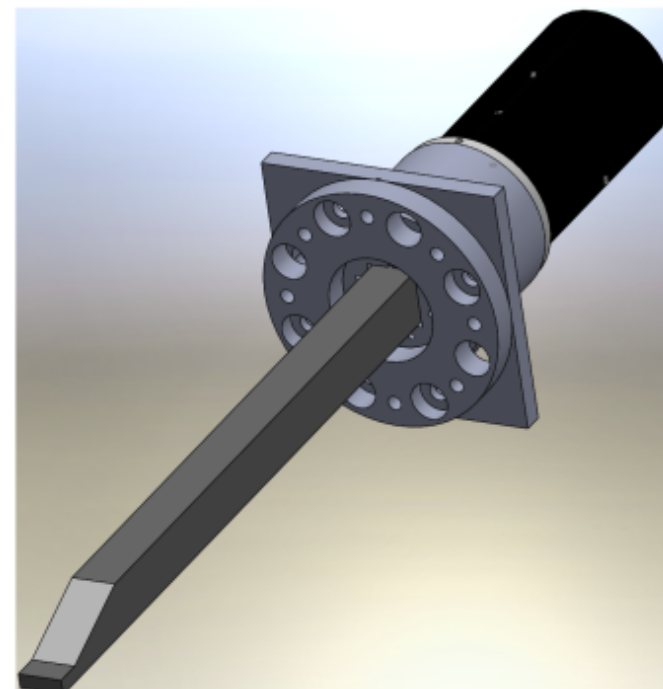
## Some CAD views of new SAM design



Radial View (looking down the LG towards beamline)



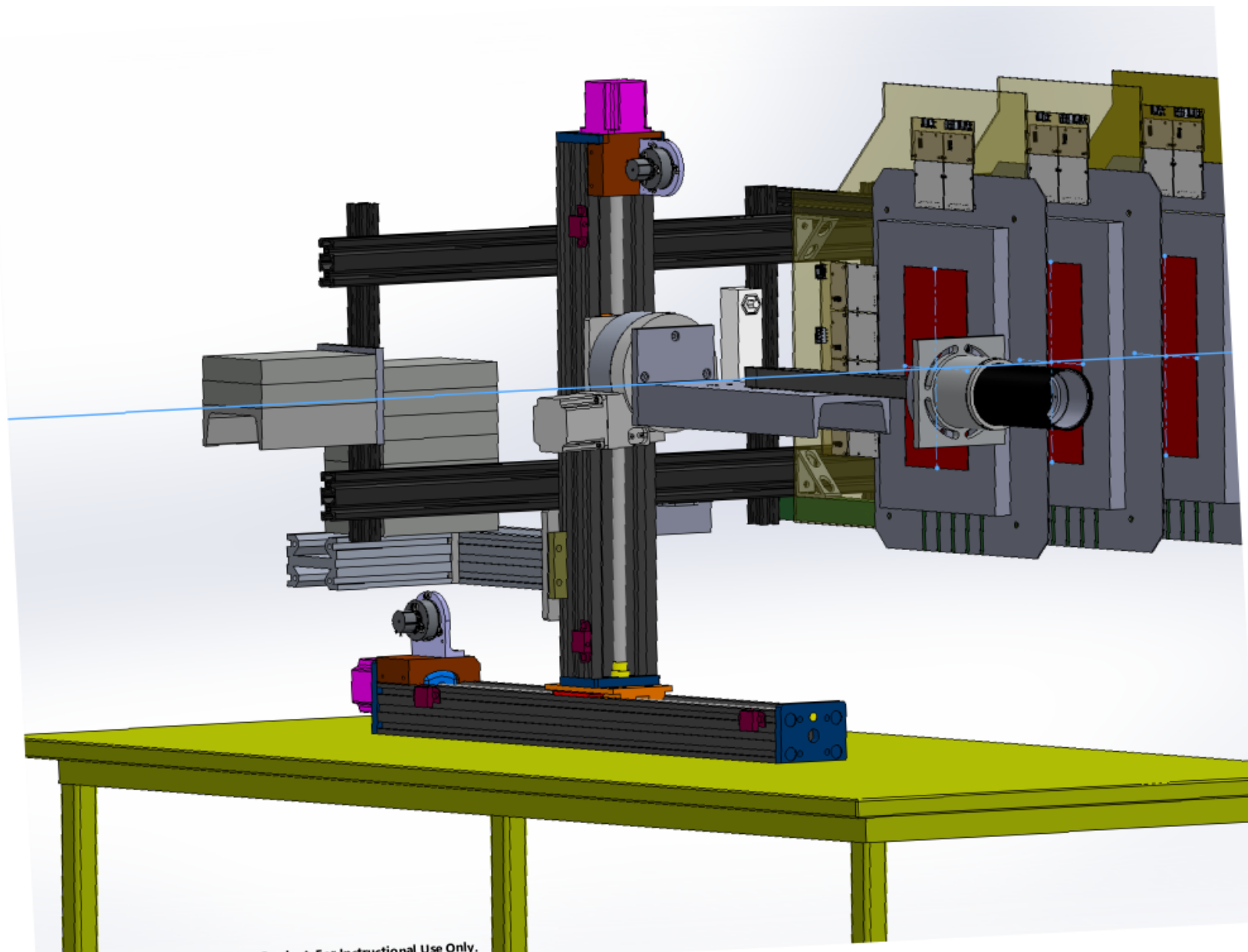
Radial View (looking up the LG away from beamline)







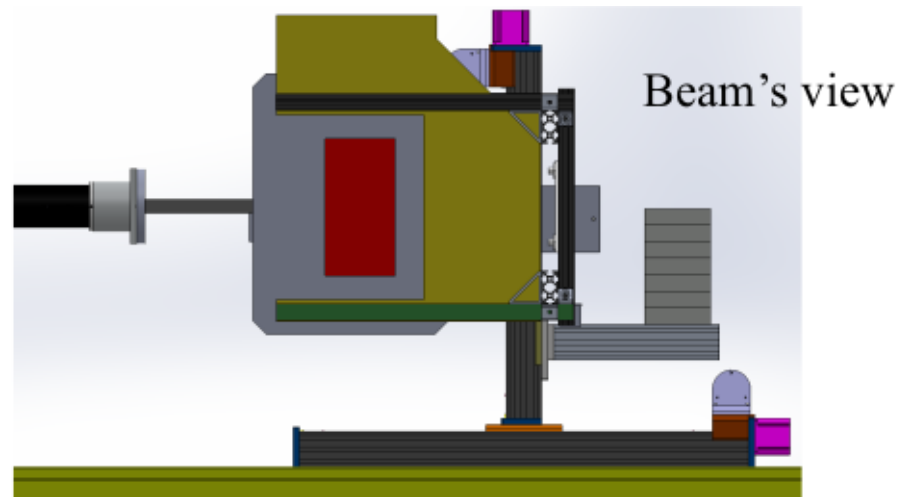
# SLAC Testbeam Setup for SAM



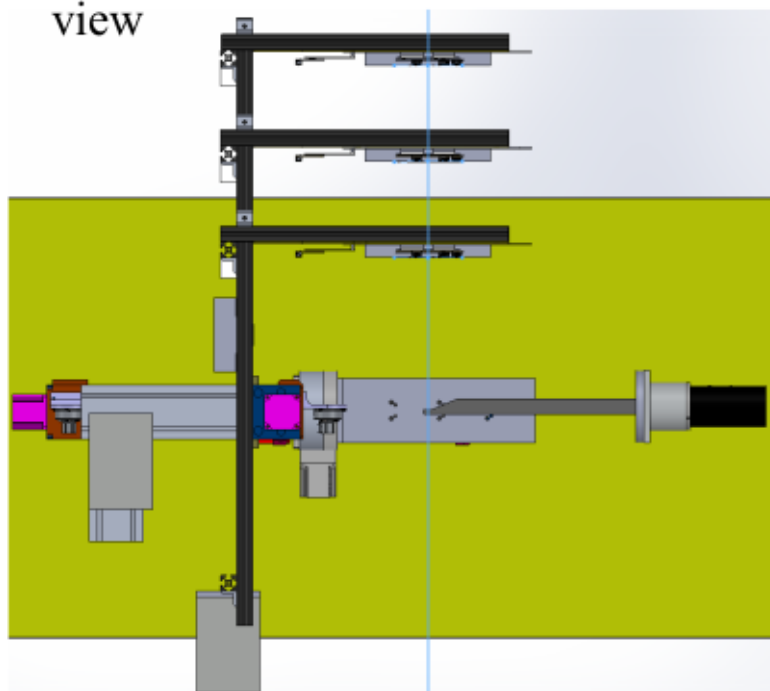
For Instructional Use Only.



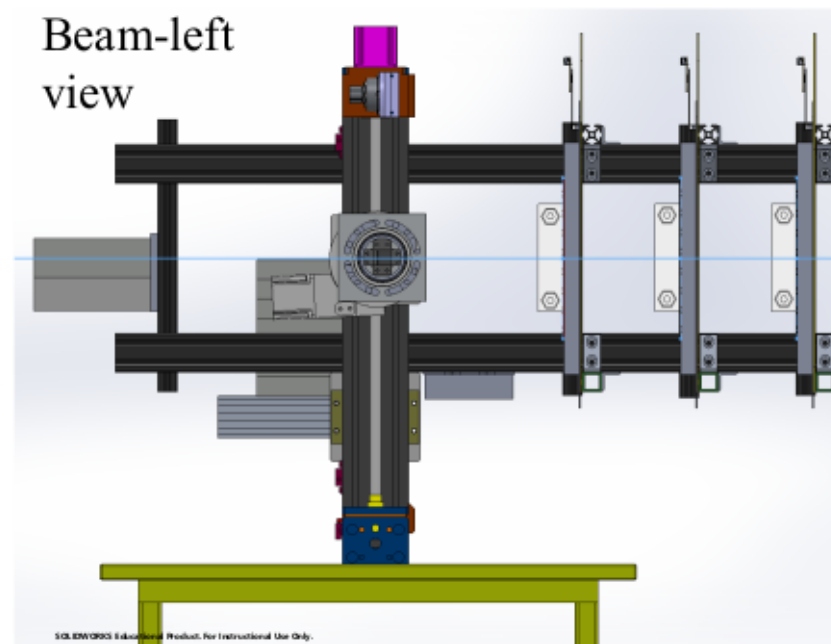
# More SLAC Testbeam Setup Views



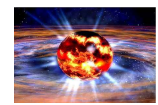
Top-down view



Beam-left view



SOLEWORKS Educational Product. For Instructional Use Only.



## Summary

- New light guides designed. Sending to shop next week; will make 10 of them and fold at least two before SLAC testbeam
- New insertion tube design nearly final (ANL will fabricate)
- 10 new quartz pieces ordered in September (\$4k); will have before Dec 1
- SLAC testbeam setup for SAMs will use existing apparatus; still working out the exact mounting strategy – thinking to use simple 8020 rails...
- At SLAC we will benchmark PE yield simulations as well as scan up the light guide a bit to examine scintillation bkgds – just realized we will want dry-air or N<sub>2</sub> flowing
- Finally, an electronic shutter system is under development for SAMs. Have procured one shutter to install and test at SLAC