New SAMs (construction and installation)

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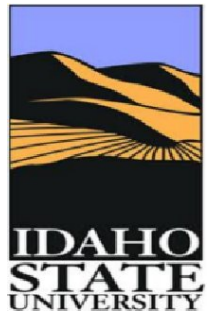
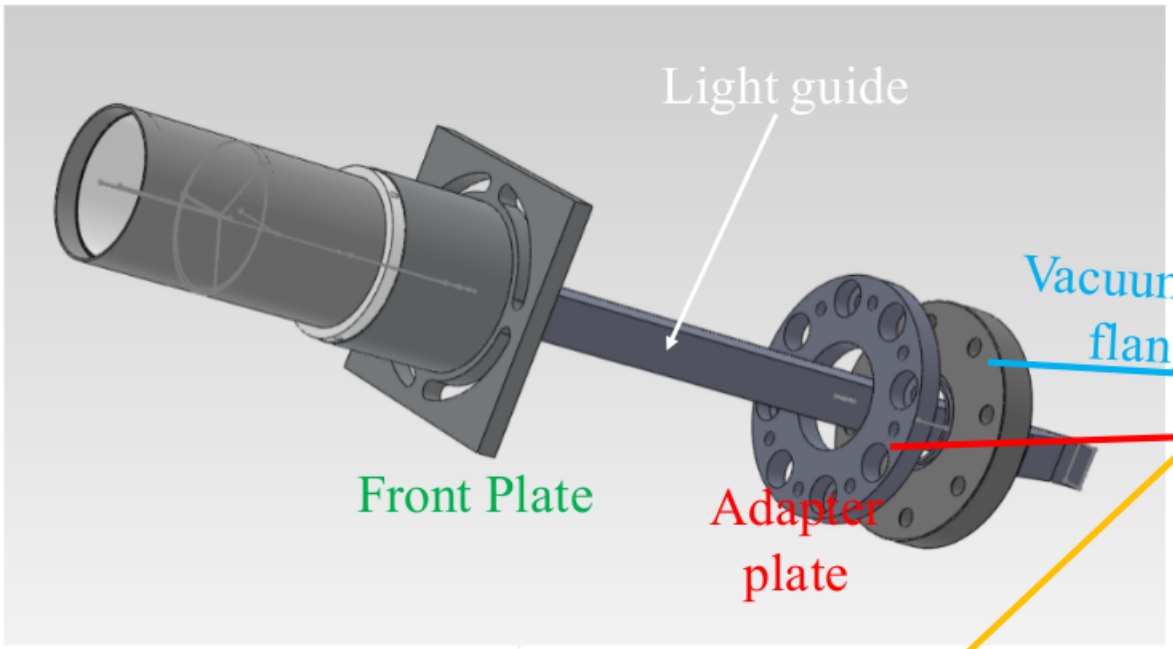


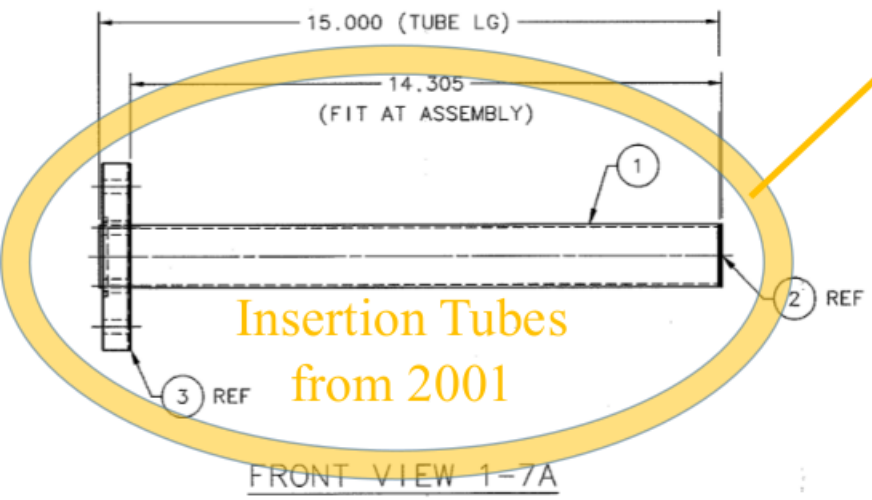
New SAMs (construction and installation)

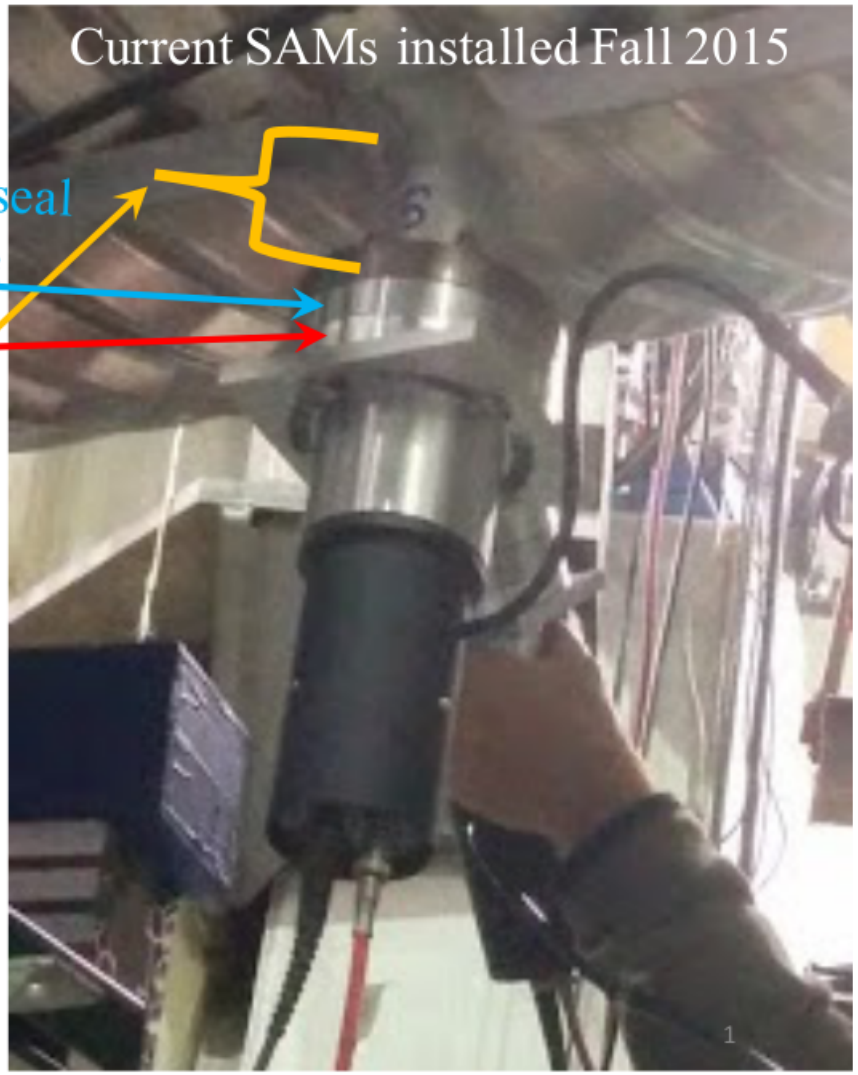
Talk Outline:

- New quartz, light guide, and vacuum insertion tube geometries
- Simulated light yields for new design
- SLAC Testbeam for SAMs (update)
- Installation plans (preliminary)
- Summary

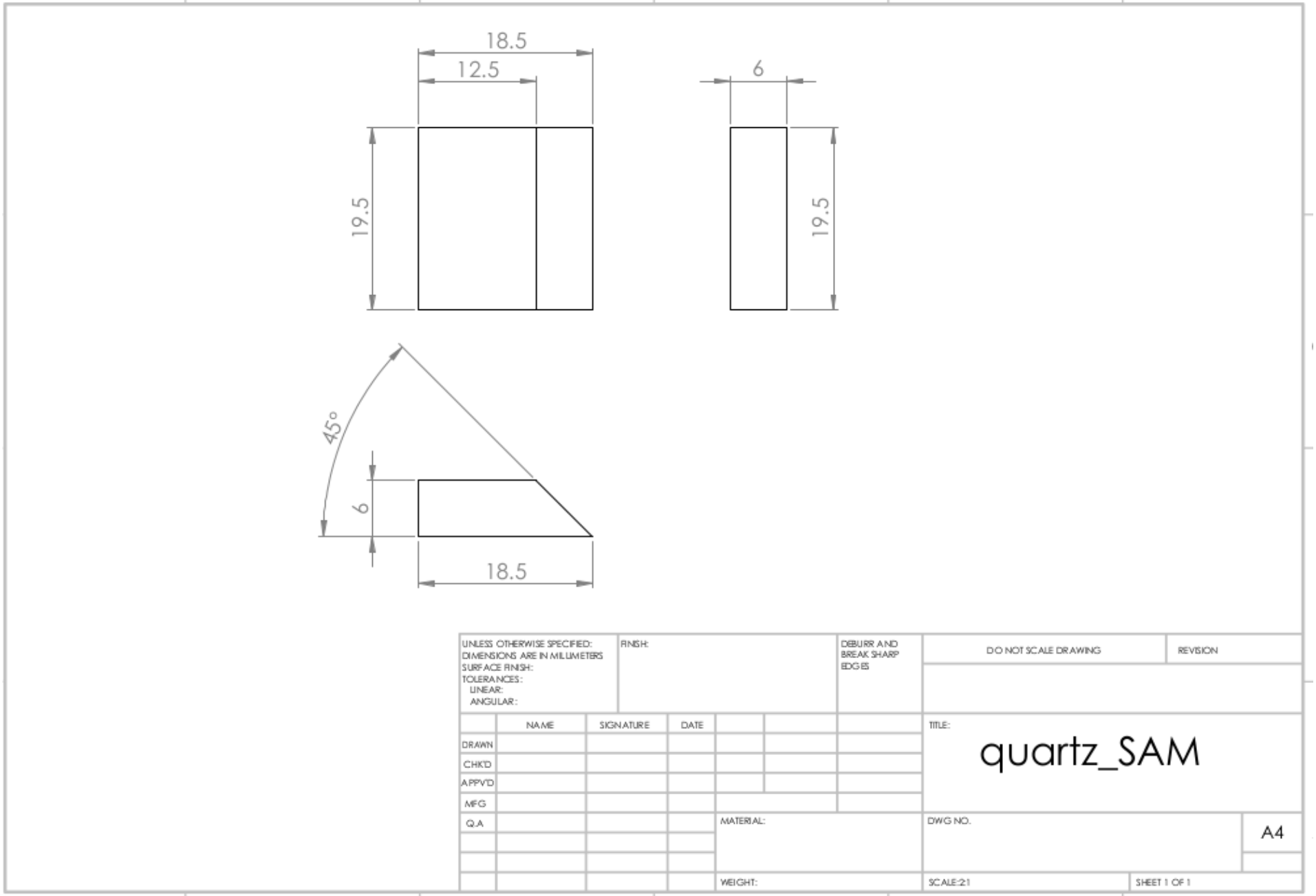
SAMs currently installed (v3: since Dec 2015)



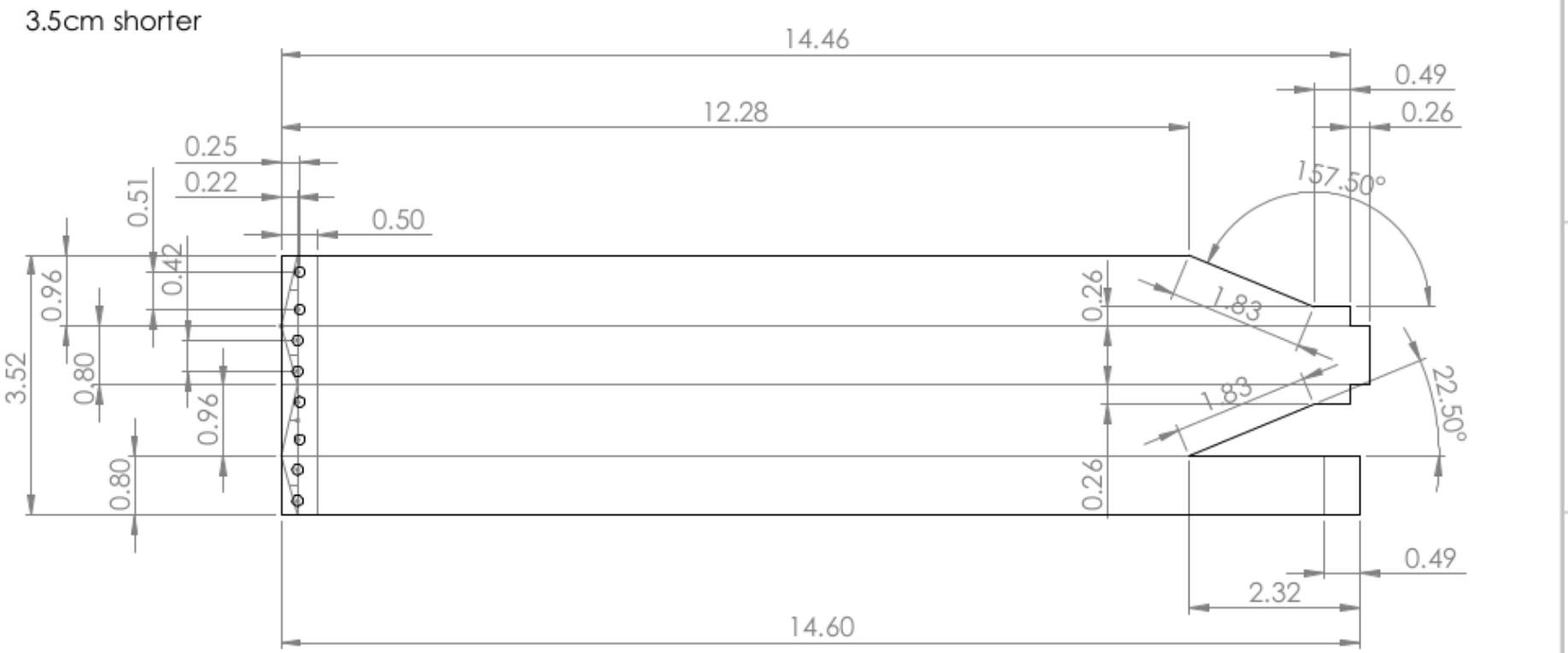




New SAM quartz: thinner and shorter

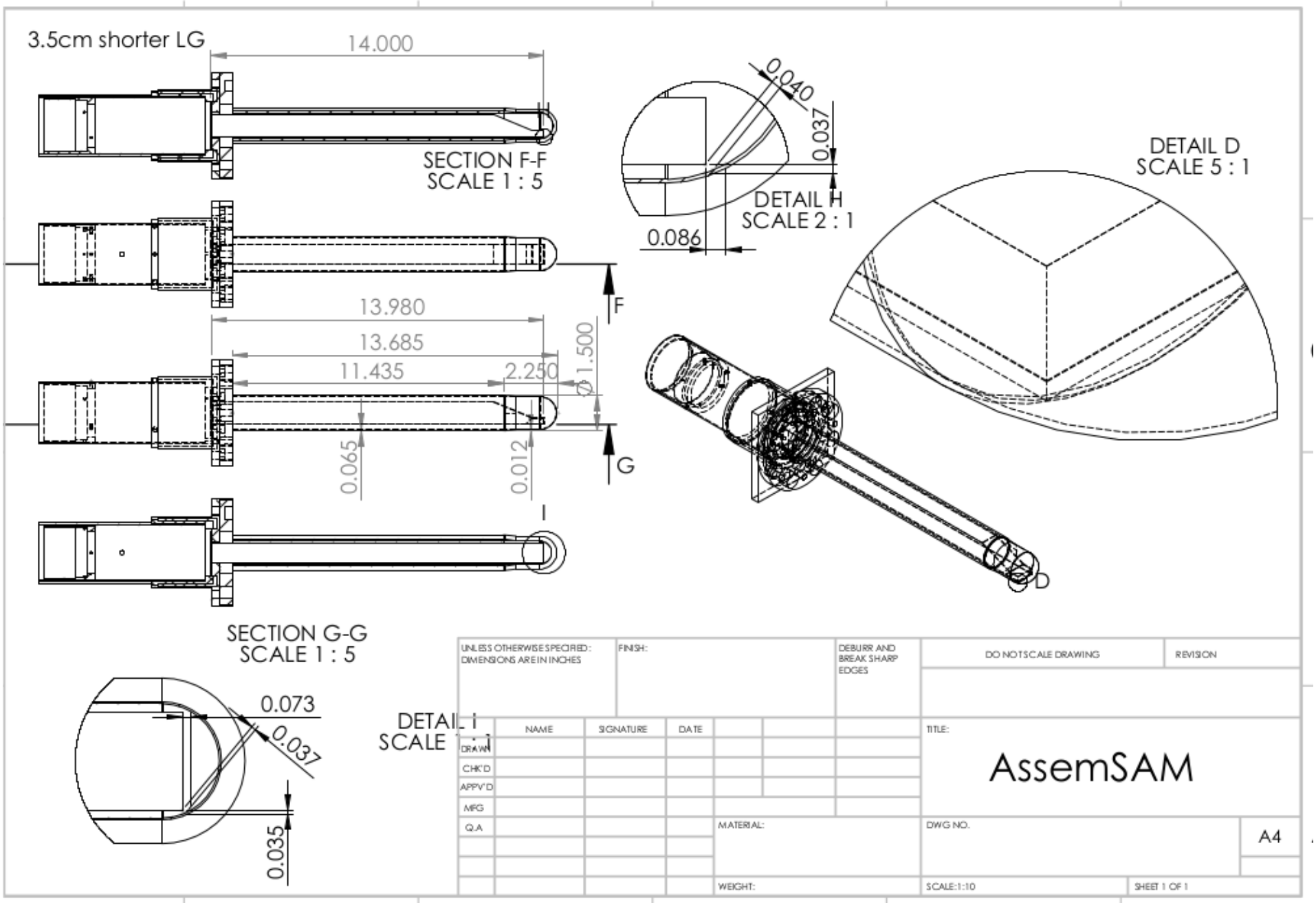


New SAM LG: 3.5 cm shorter, redesigned

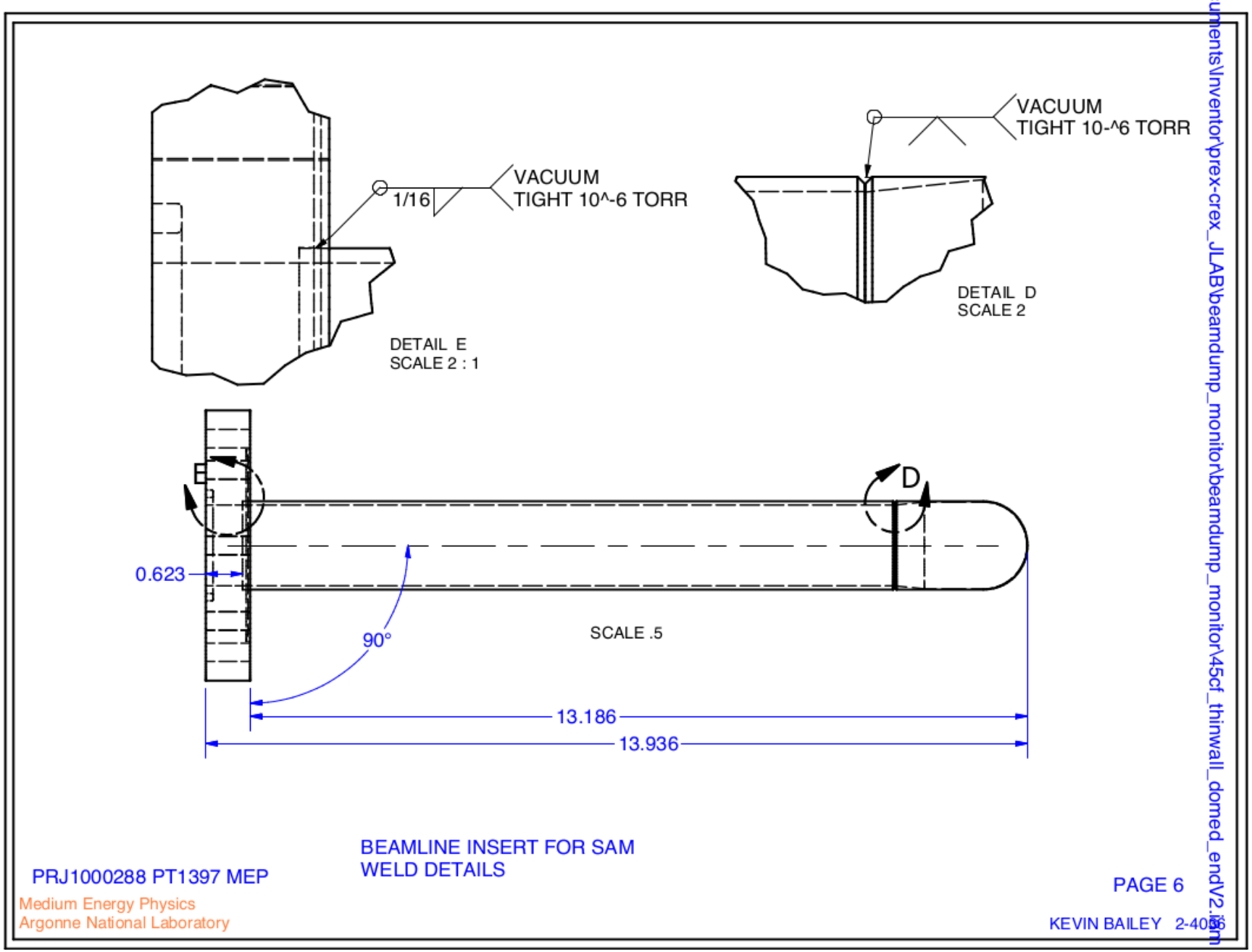


UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES		FINISH:			DEBURR AND BREAK SHARP EDGES	DO NOT SCALE DRAWING	REVISION
	NAME	SIGNATURE	DATE			TITLE: SAMPLATE01	
DRAWN							
CHK'D							
APPV'D							
MFG							
Q.A				MATERIAL:		DWG NO.	A4
				WEIGHT:		SCALE:1:5	SHEET 1 OF 1

New Vacuum Tubes–shorter; spherical endcap



New Vacuum Tubes–weld details



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

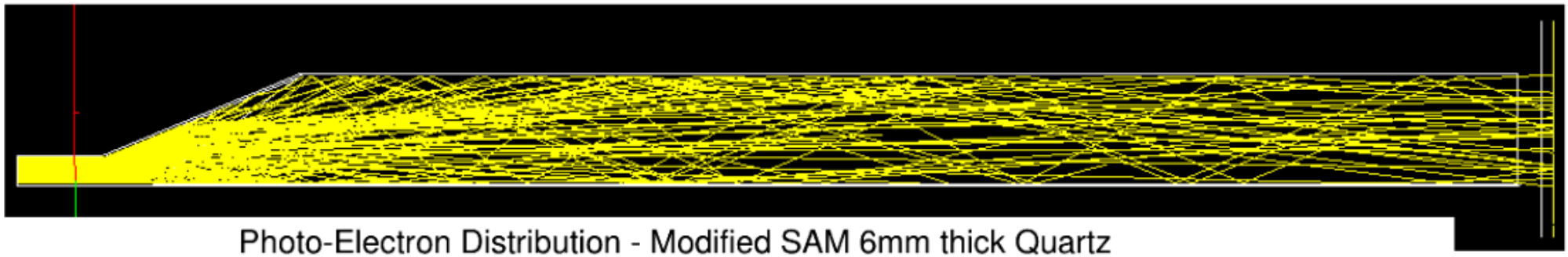
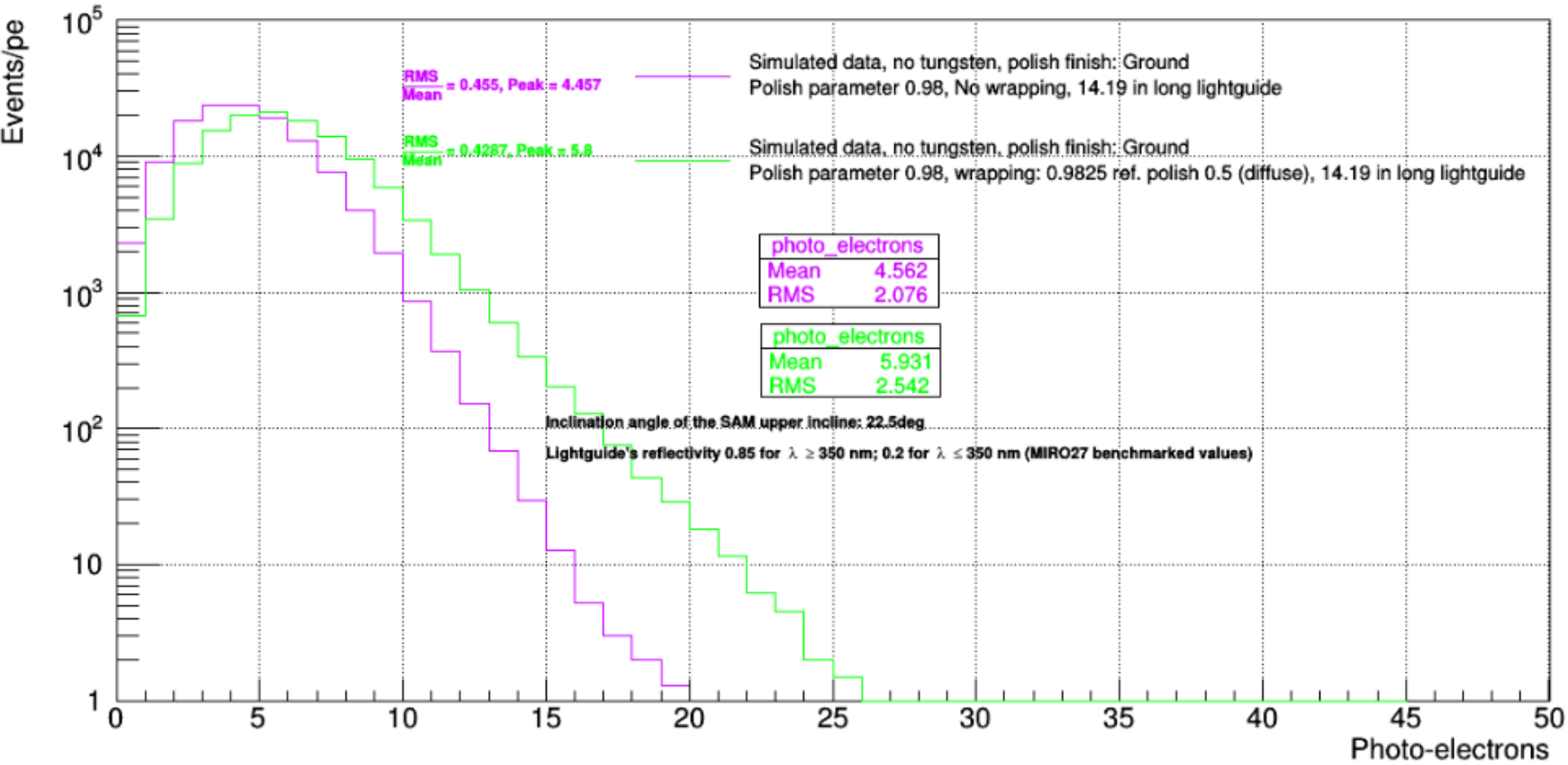
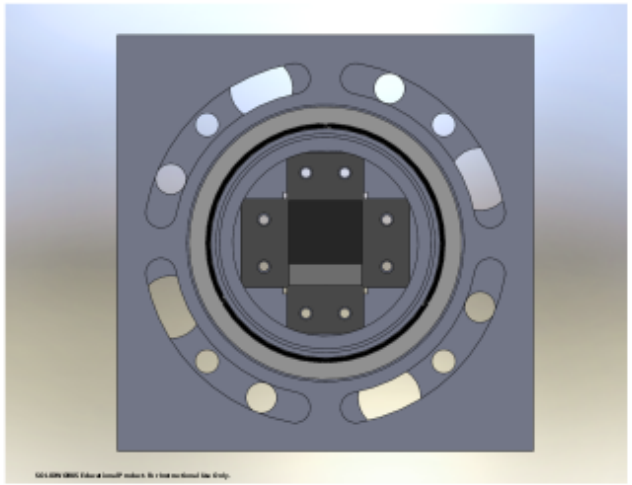


Photo-Electron Distribution - Modified SAM 6mm thick Quartz

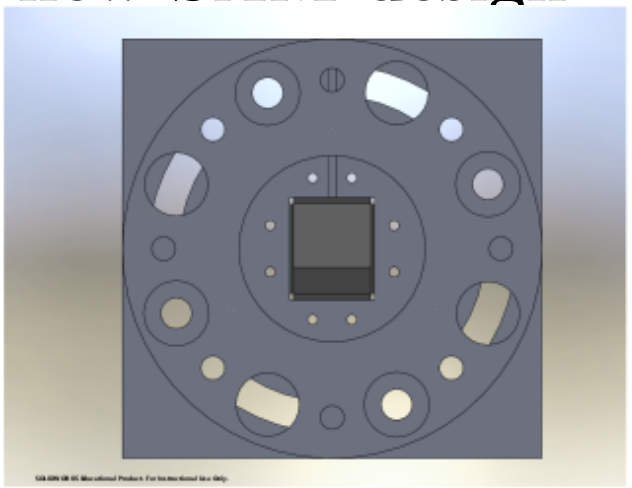


About 6 PEs per electron with 43% resolution

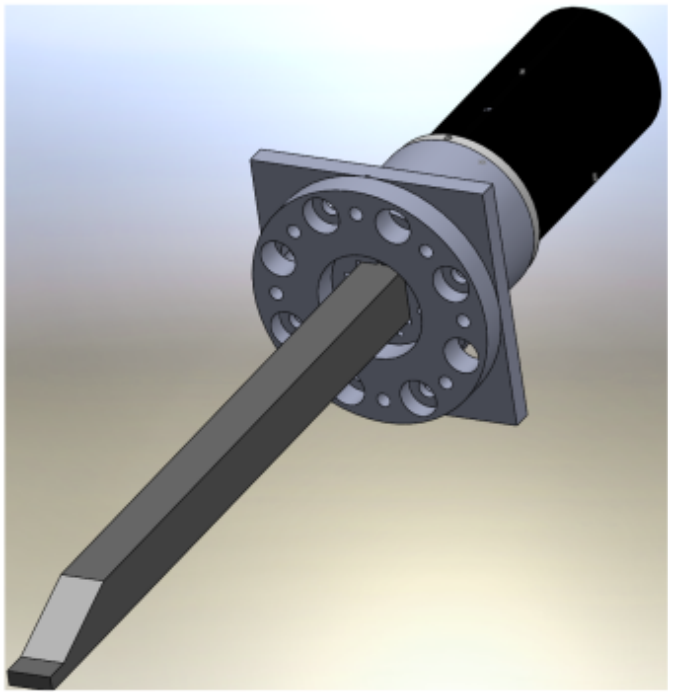
Some CAD views of new SAM design



Radial View (looking down the LG towards beamline)

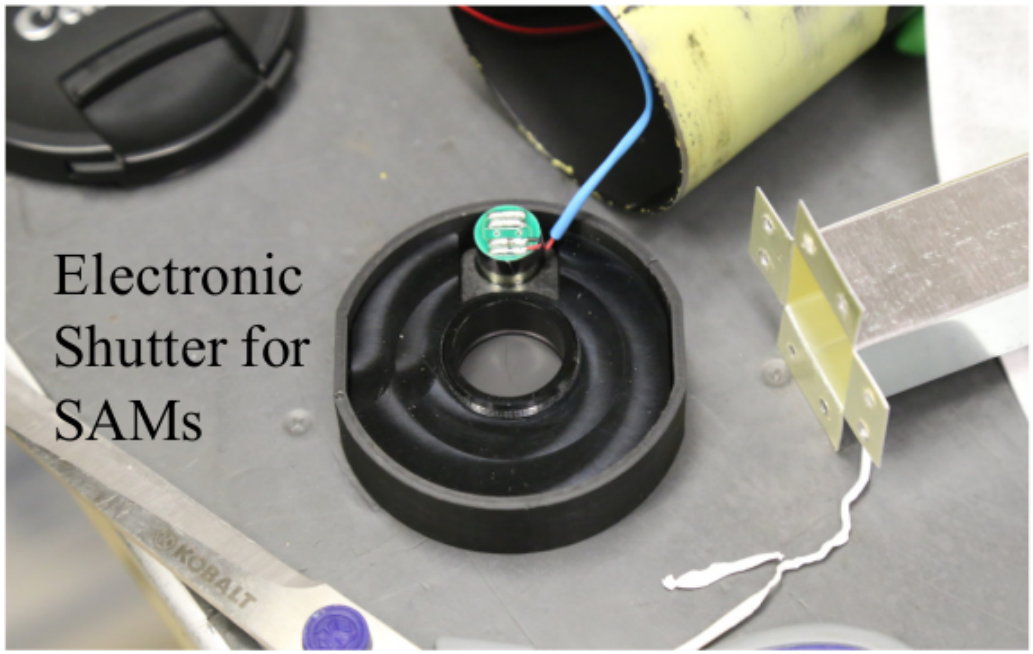


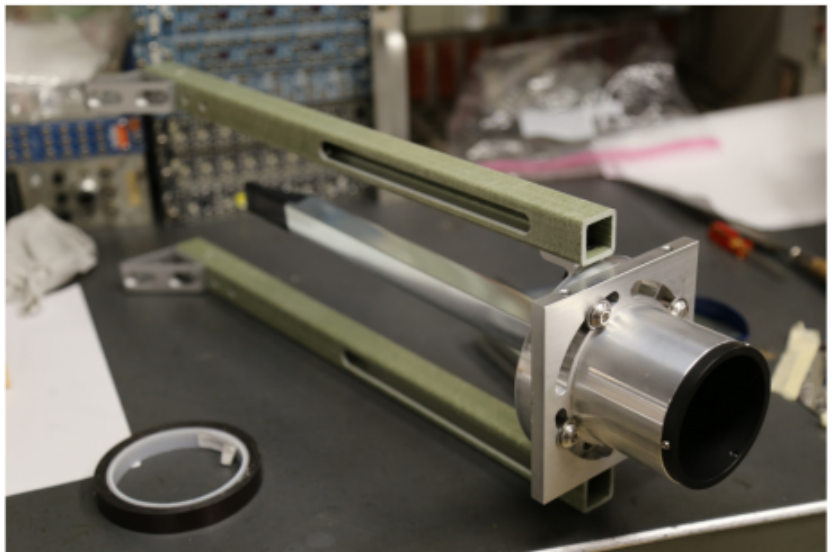
Radial View (looking up the LG away from beamline)

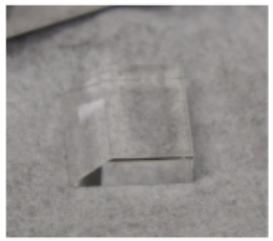


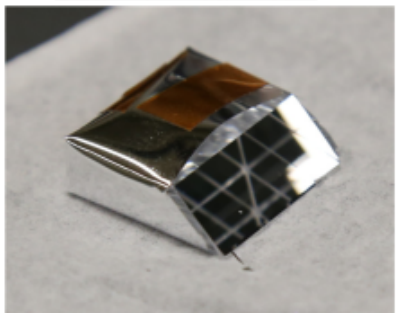
New SAM Lightguides

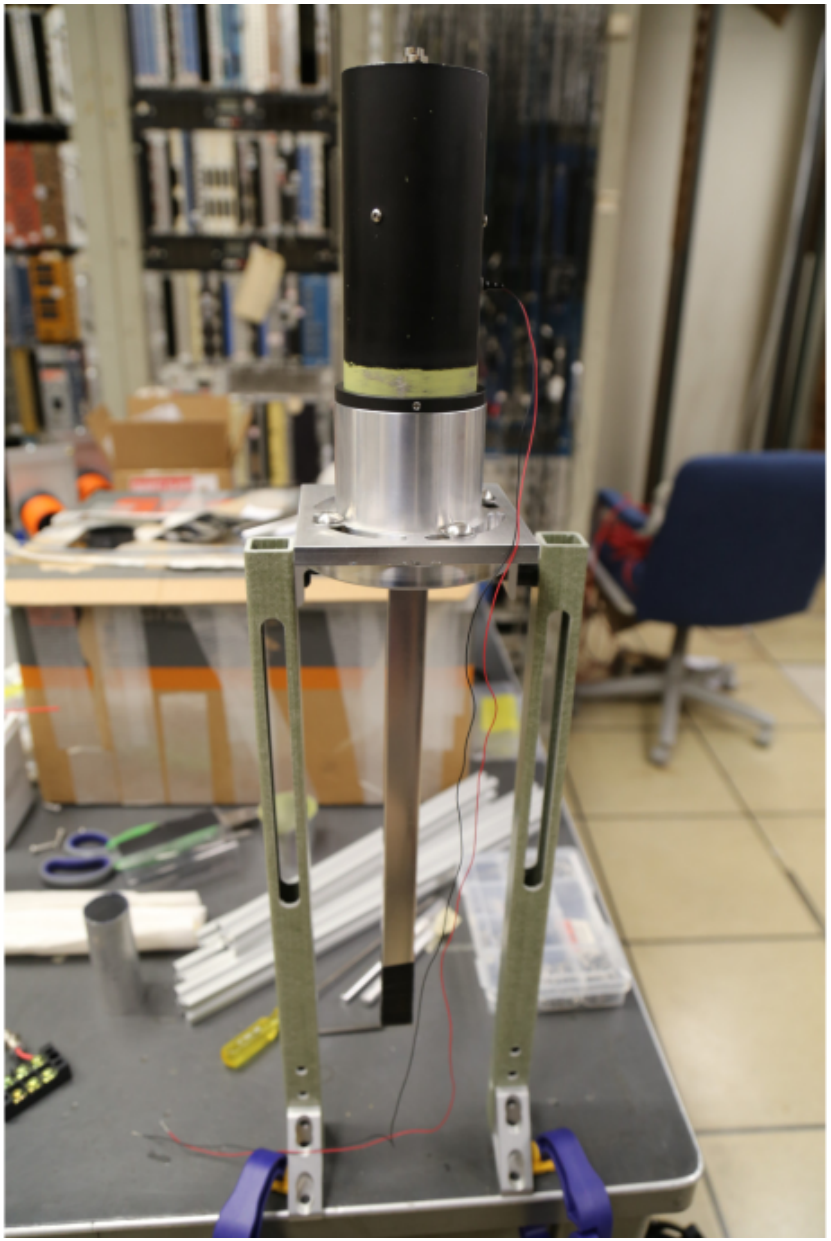
Photos of new SAM parts at SLAC











SLAC Testbeam Setup for SAM

Drawing of original setup idea for SAM beamtests at SLAC ESTB

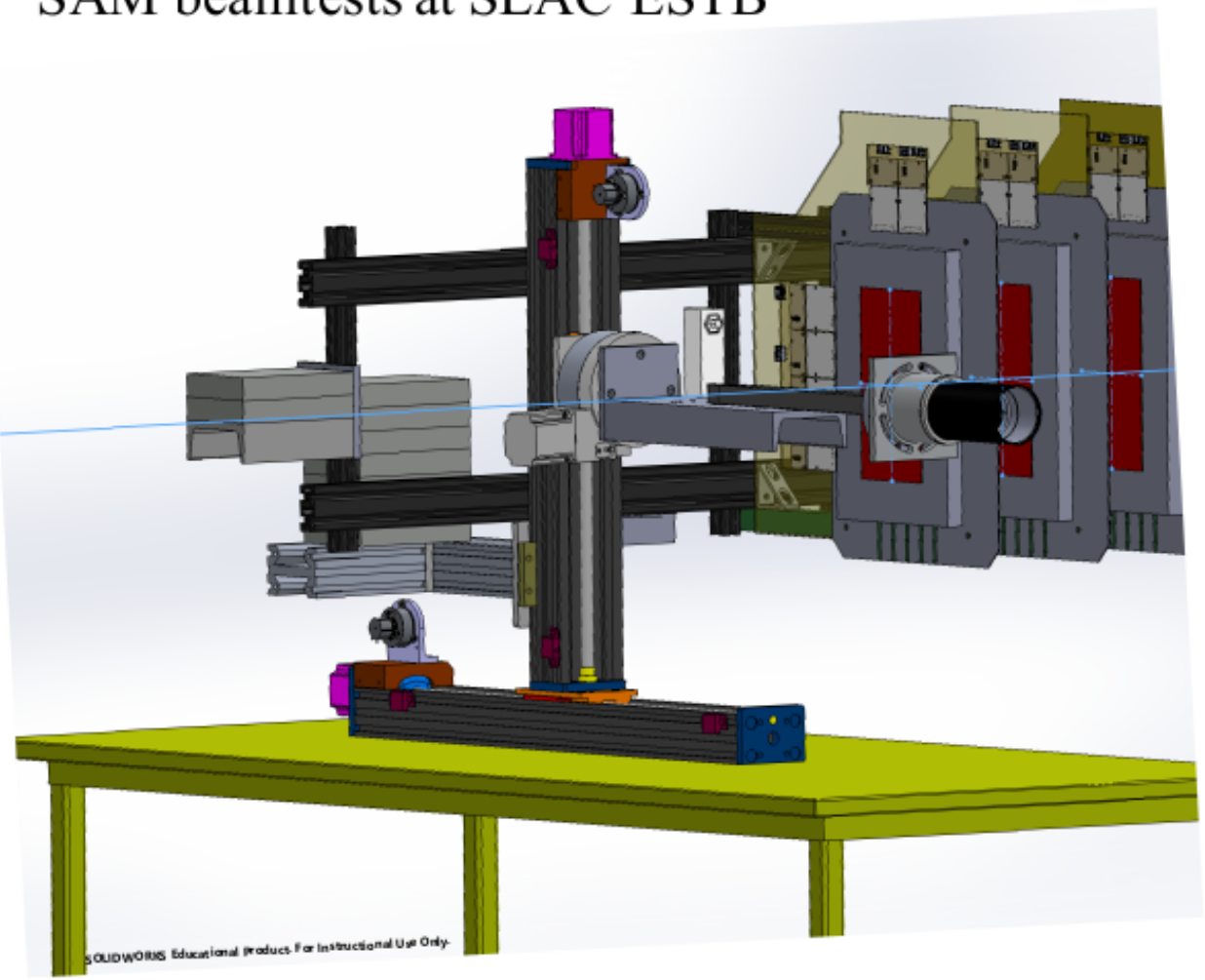
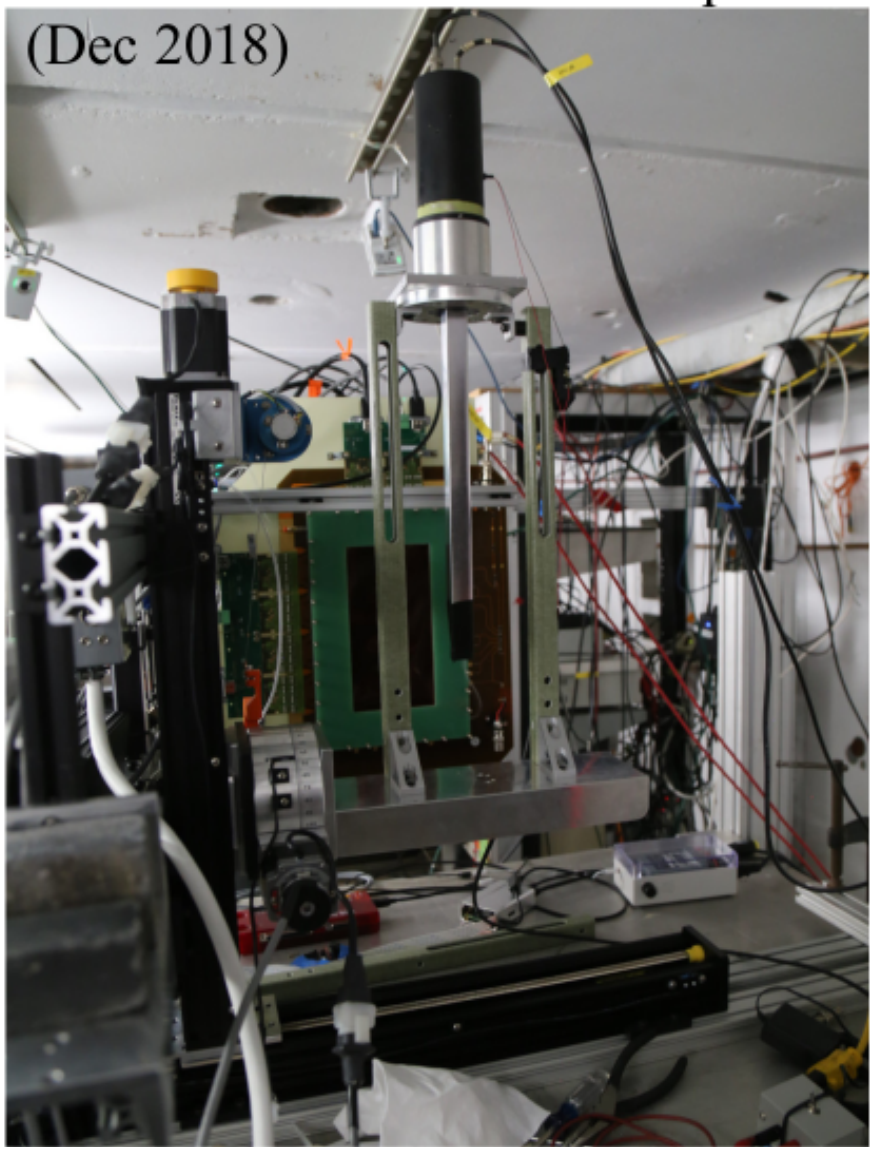


Photo of SAM testbeam setup (Dec 2018)



Summary (construction)

- New light guides designed. Sent to shop in November and folded in December 2018; have 10 in hand
- New insertion tube design finalized in Nov/Dec 2018 (fabricated at ANL for $\sim$ \$10k); leak-tested and Meekins approved?; should have all 8 in hand by end of the month
- 10 new SAM quartz pieces (\$4k) delivered in Nov 2018
- Electronic shutter system designed for new SAMs. Installed and $\sim$successfully tested at SLAC; do not know radiation hardness or failure mode yet; developing shutter control system now; may remove shutters after initial commissioning
- SLAC plans to benchmark new SAMs failed (for a few reasons): first, the high sensistivity range on QDC was not setup properly, second, it was very difficult to put the beam on the small SAM quartz, and third, we ran out of time

Summary (installation)

- All components will be ready for installation by mid March; will coordinate expected install date with Jesse and radcon through an HAList/atlis submission
- The HRSs need to be moved to larger angle for installation
- The beamline (near SAMs) must be brought up to atmosphere
- Coordinating with RadCon, the old SAM assemblies will be removed from beamline; the lightguides and quartz can be stored if activated
- The old insertion tubes will be removed and replaced with new ones; can likely reuse hardware as well as vacuum seal flanges
- Install new SAMs
- Reconfigure preAmps – may need some additional Qwak preAmps here