

SoLID Collaboration Meeting

Heavy gas Cerenkov Design Update

March 22th 2013

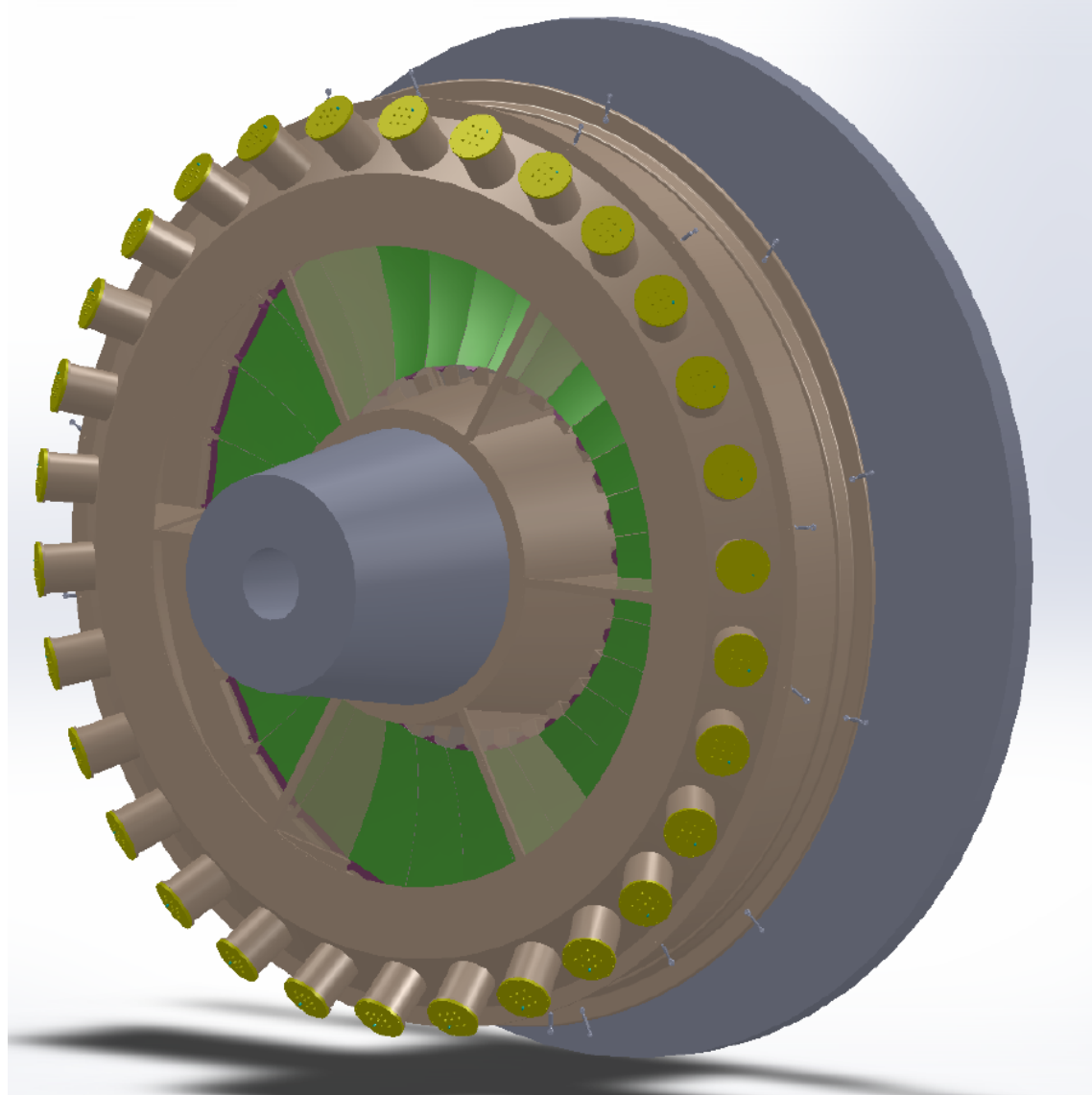
Mehdi Meziane, Gary Swift

Duke University

CLEO II Geometry

Optimized Positions of

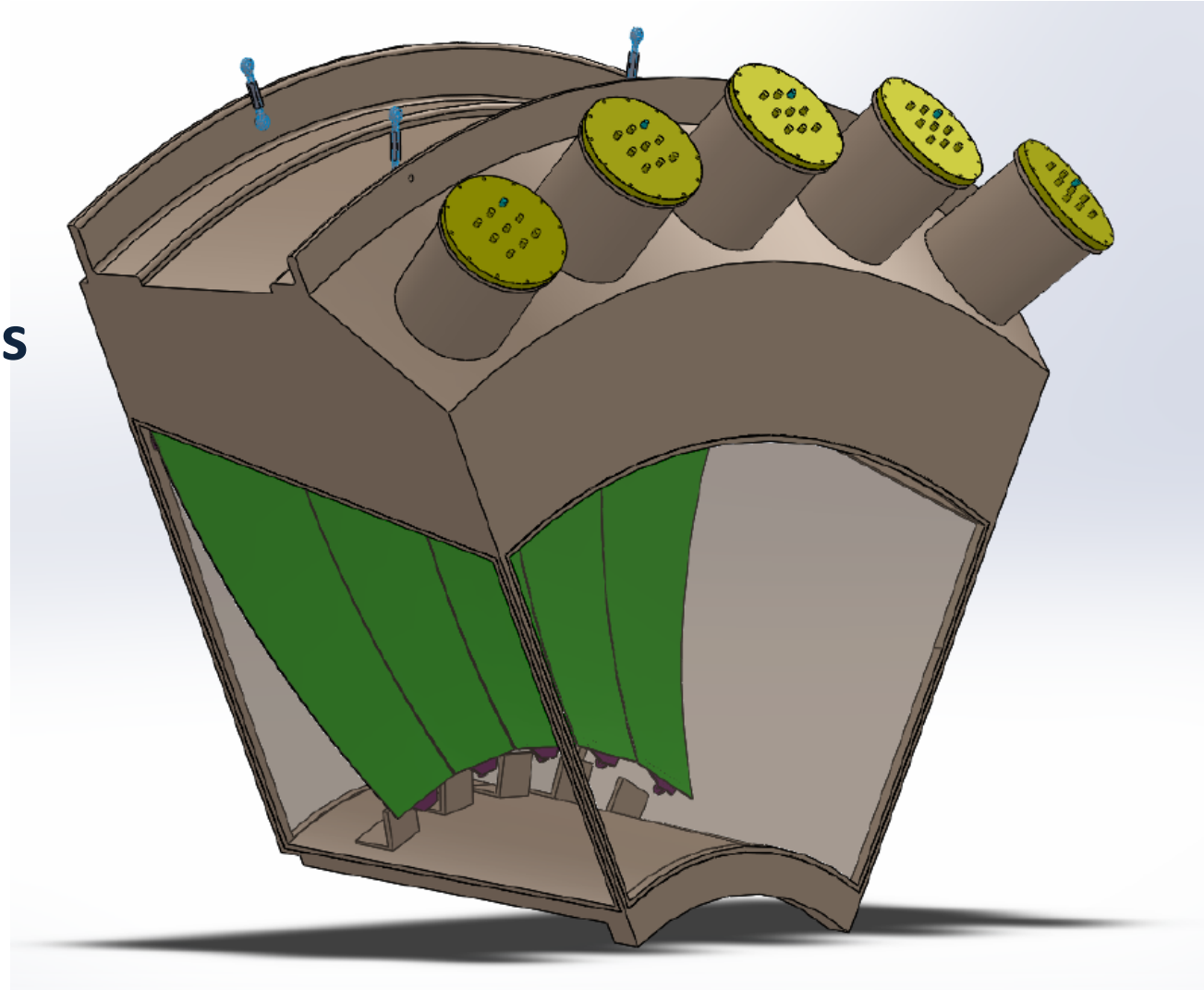
- PMTs
- Winston Cones
- Mirrors



6 segments of 60°

With 5 sets of

- PMTS**
- Conical mirrors**
- Spherical mirrors**

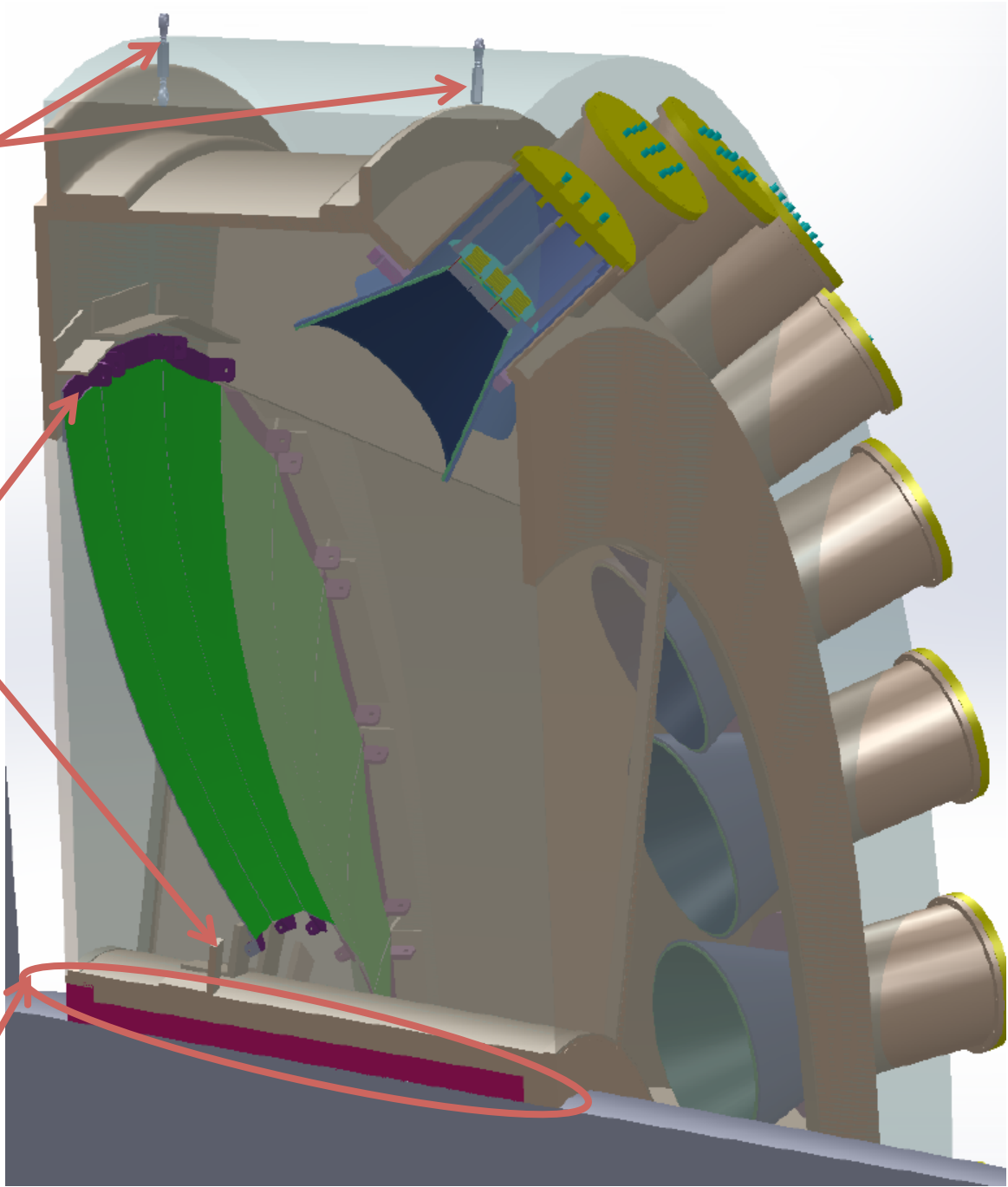


Option 1: Turnbuckle
Option 2: Rod

...

Three point mirror attachment

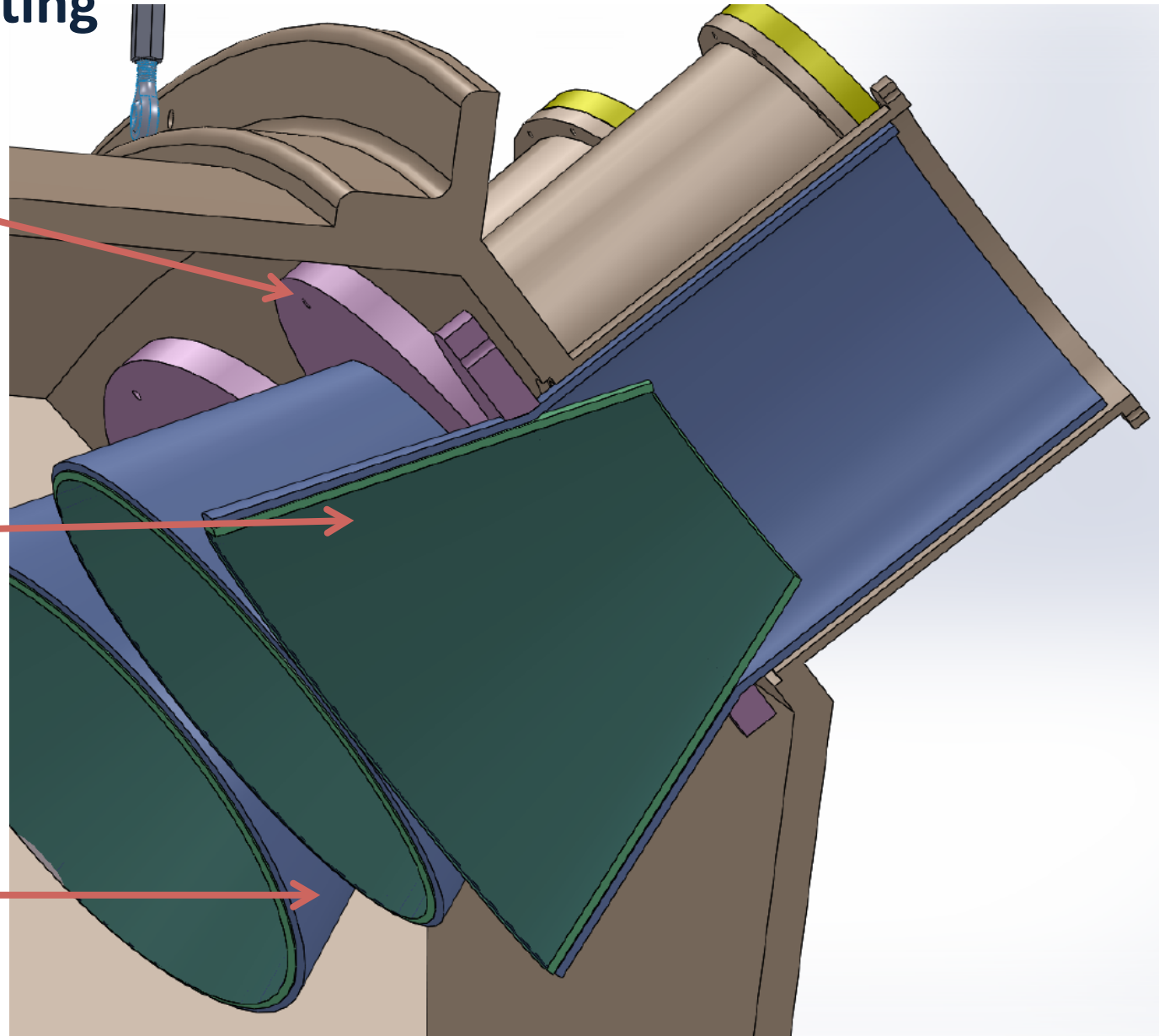
Attachment piece (precision machined) bolted to the nose

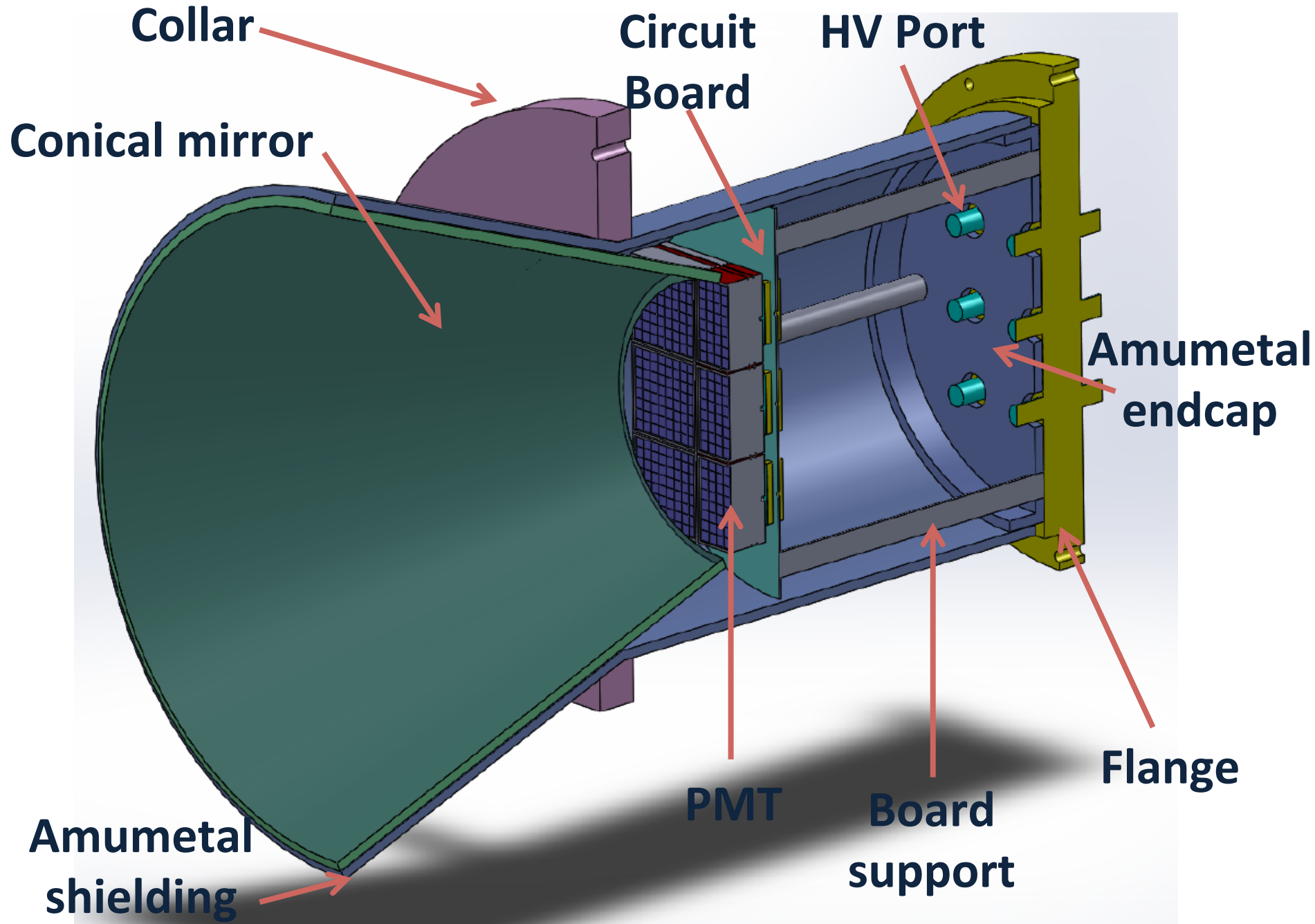


**Collar for mounting
cone/shield
to the shell**

Conical mirror

**Amumetal
shielding**

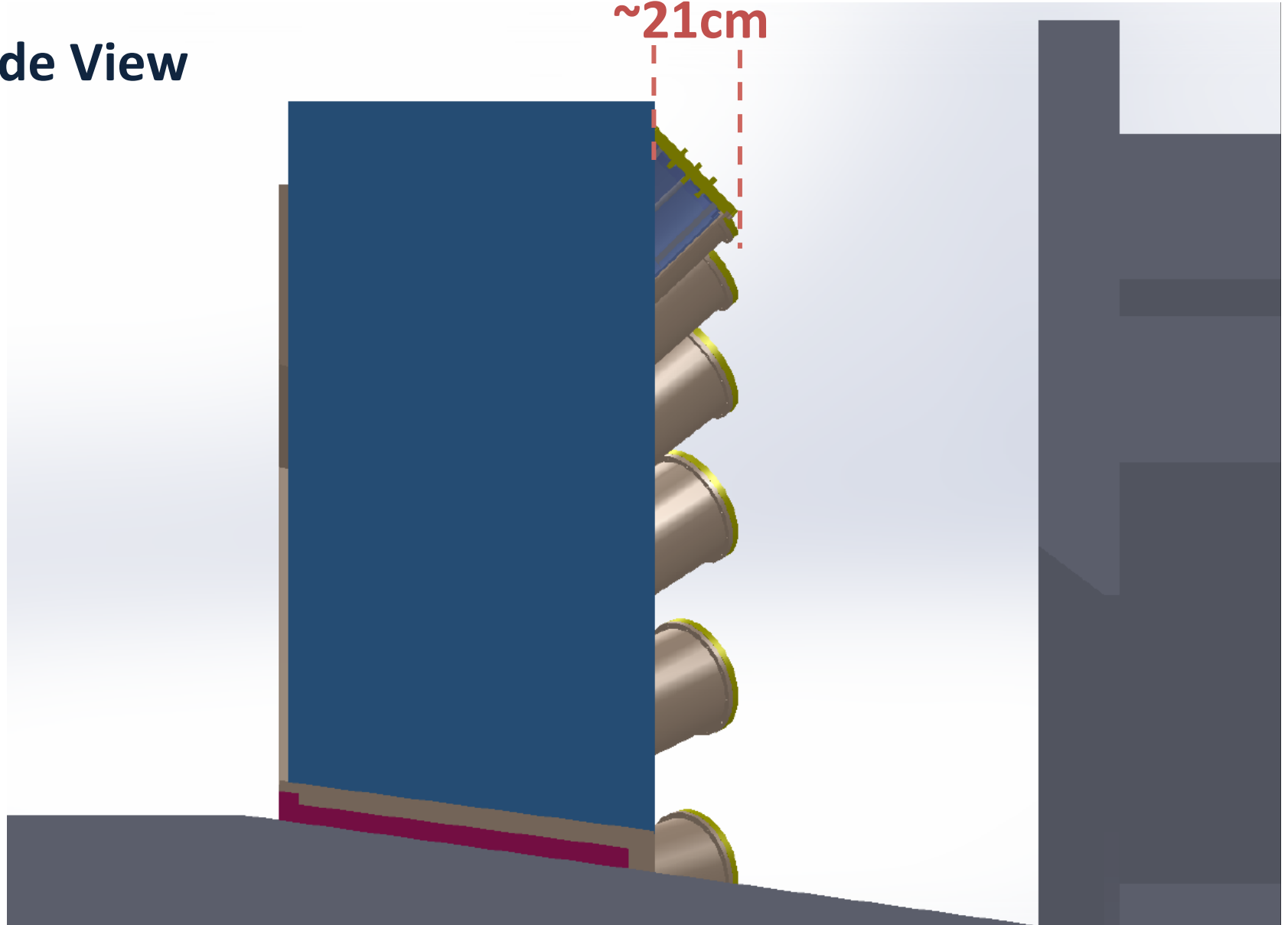




Space Issue

Side View

~21cm



Cost Estimate

	COST	
Mirrors		\$277k
PMTs		\$837k
Tank	Material	\$50k
	Assembly hardware	\$15k
	Shop work	\$100k
Gas System	System Sensor, Piping	\$50k
	Recovering System	\$35k
Gas		\$154k
Total		\$1.58M +3/4 technician year

To Do

- **Detailed design of**
 - Tank attachment (turnbuckle, rod)
 - Mirror and cone assembly (clip, glue...)
 - Mirror attachment
- **Structural analysis and detailed design of the tank as a pressure vessel per Jlab guidelines**
- **Common design with Light Gas Cerenkov**
- **Window material, thickness**
 - One Option: High strength Al alloy (7076 or 2024) sheet
 - Upstream/side 0.5mm thick
(external support: Ti wire or Kevlar thread)
 - Downstream 4-6mm thick