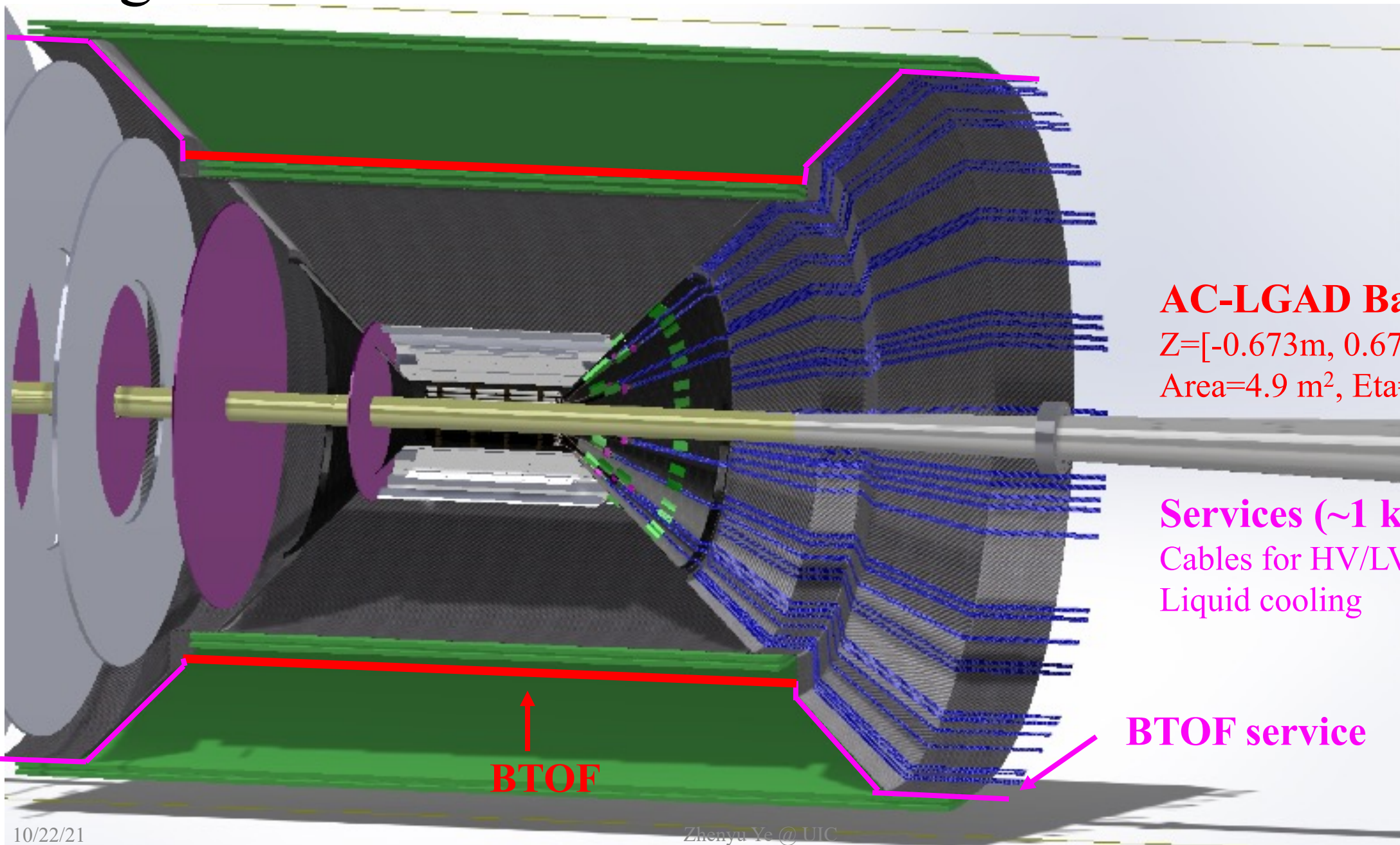


ATHENA Barrel TOF Cost

- Total cost on project: **\$8.2M** = **\$5.1M M&S** + **\$3.1M Labor**
 - includes \$3.4M for R&D, prototyping and final design optimization that will be shared with B0, RPs, and other EIC experiments with AC-LGAD
- Total in-kind cost: **\$0.85M** = **\$50k M&S** + **\$0.80M Labor**
 - All the cost is for R&D, prototyping and final design optimization that will be shared with B0, RPs, and other EIC experiments with AC-LGAD
- Total Labor: **(7.5 EE+2.0 ME+1.5 ET+1.5 MT+5 postdoc+7 PhD student)*1 Y**

Integration of BTOF into ATHENA



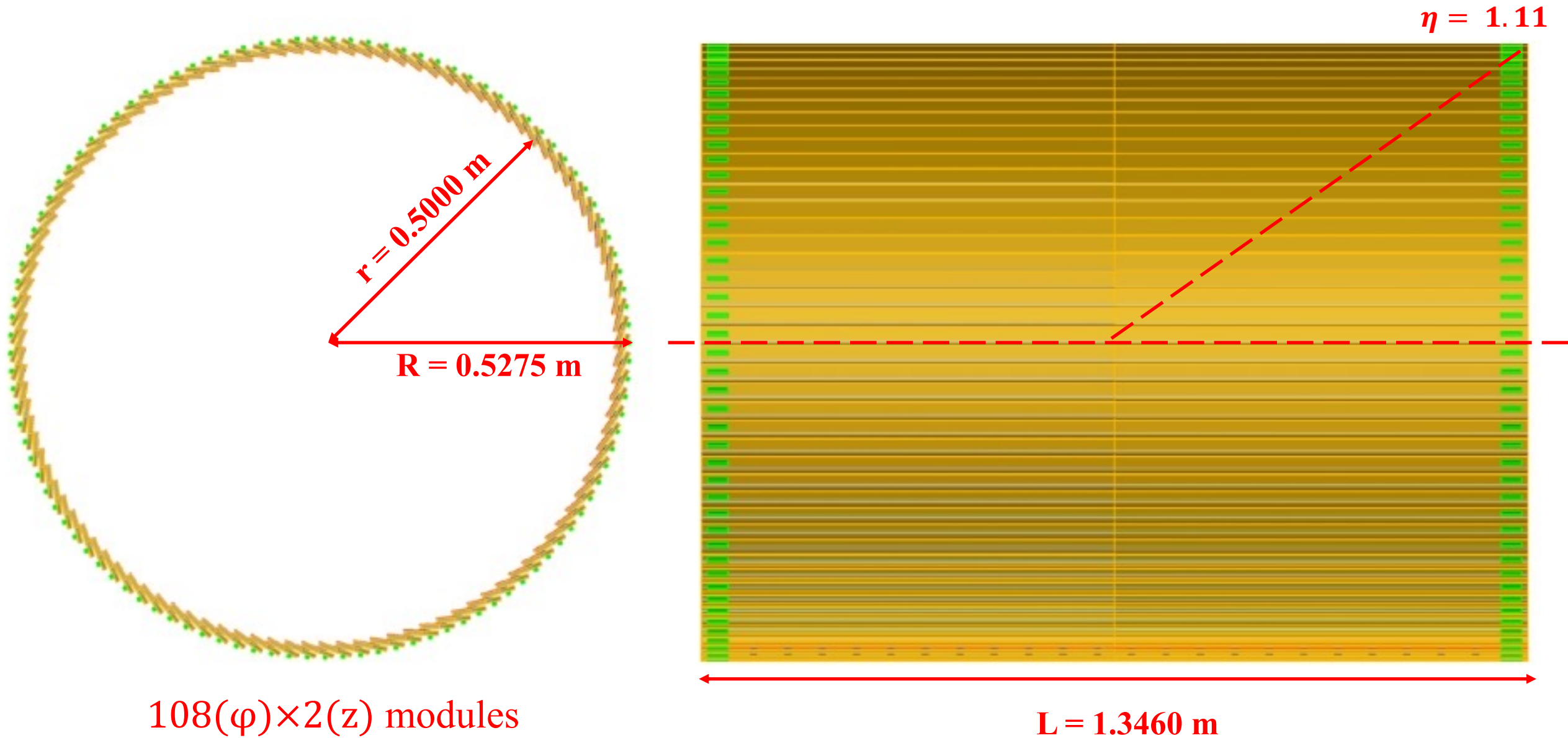
AC-LGAD Barrel TOF
 $Z=[-0.673\text{m}, 0.673\text{m}]$, $R=0.5\text{m}$,
Area= 4.9 m^2 , $\text{Eta}=[-1.11, 1.11]$

Services (~1 kW)
Cables for HV/LV, I/O signals
Liquid cooling

BTOF service

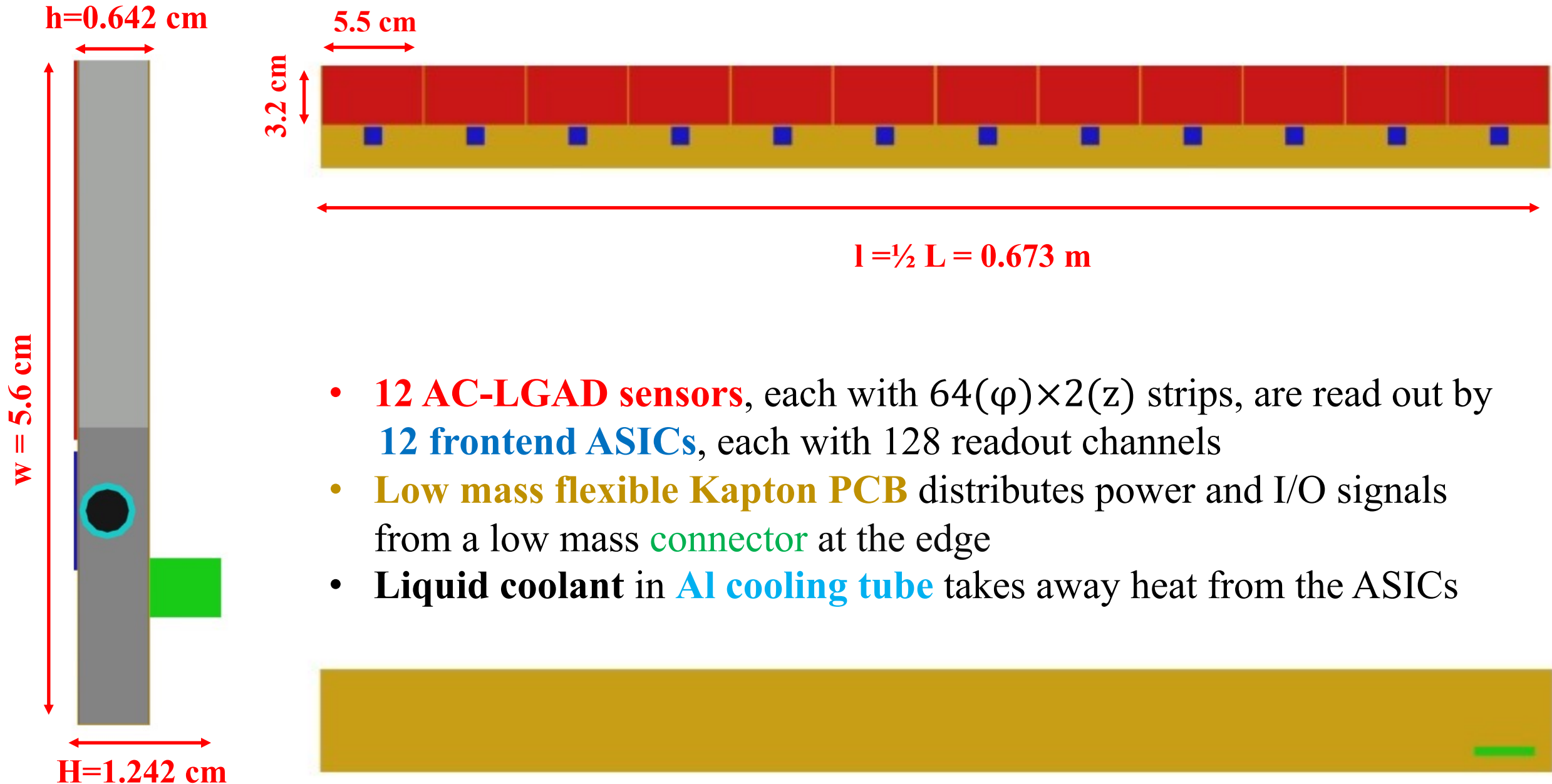
BTOF

ATHENA Barrel TOF Detector Layout



ATHENA Barrel TOF Module

98 % coverage in Z



- **12 AC-LGAD sensors**, each with $64(\varphi) \times 2(z)$ strips, are read out by **12 frontend ASICs**, each with 128 readout channels
- **Low mass flexible Kapton PCB** distributes power and I/O signals from a low mass **connector** at the edge
- **Liquid coolant in Al cooling tube** takes away heat from the ASICs