Integration of BTOF into ATHENA

AC-LGAD Barrel TOF
Z=[-0.673m, 0.673m],
R=0.525m, Area=4.9 m², Eta=[-1.11, 1.11]

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

BTOF service

BTOF
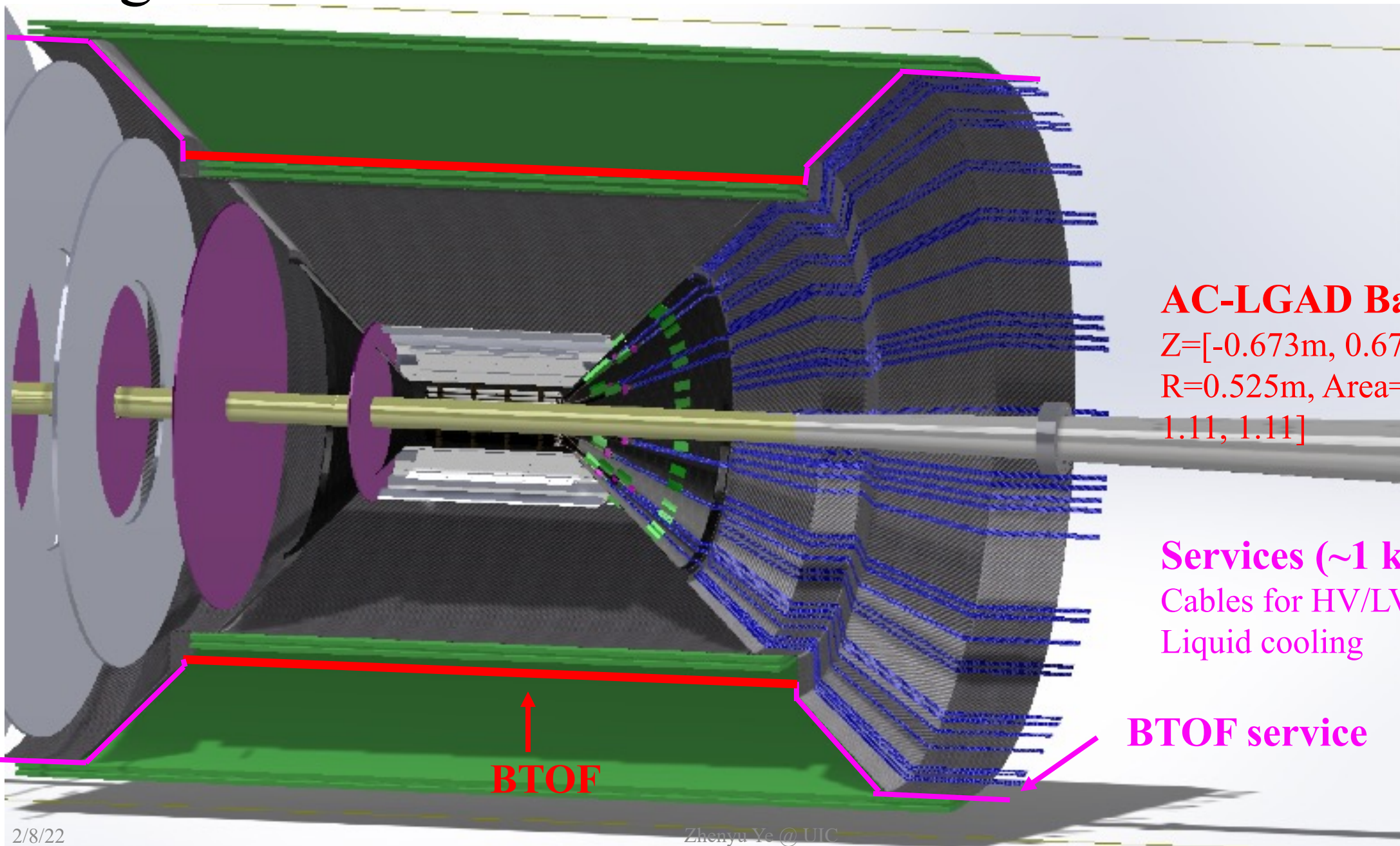
ATHENA Barrel TOF Detector Layout

r = 0.525 m

108(φ)×2(z) modules

η = 1.11
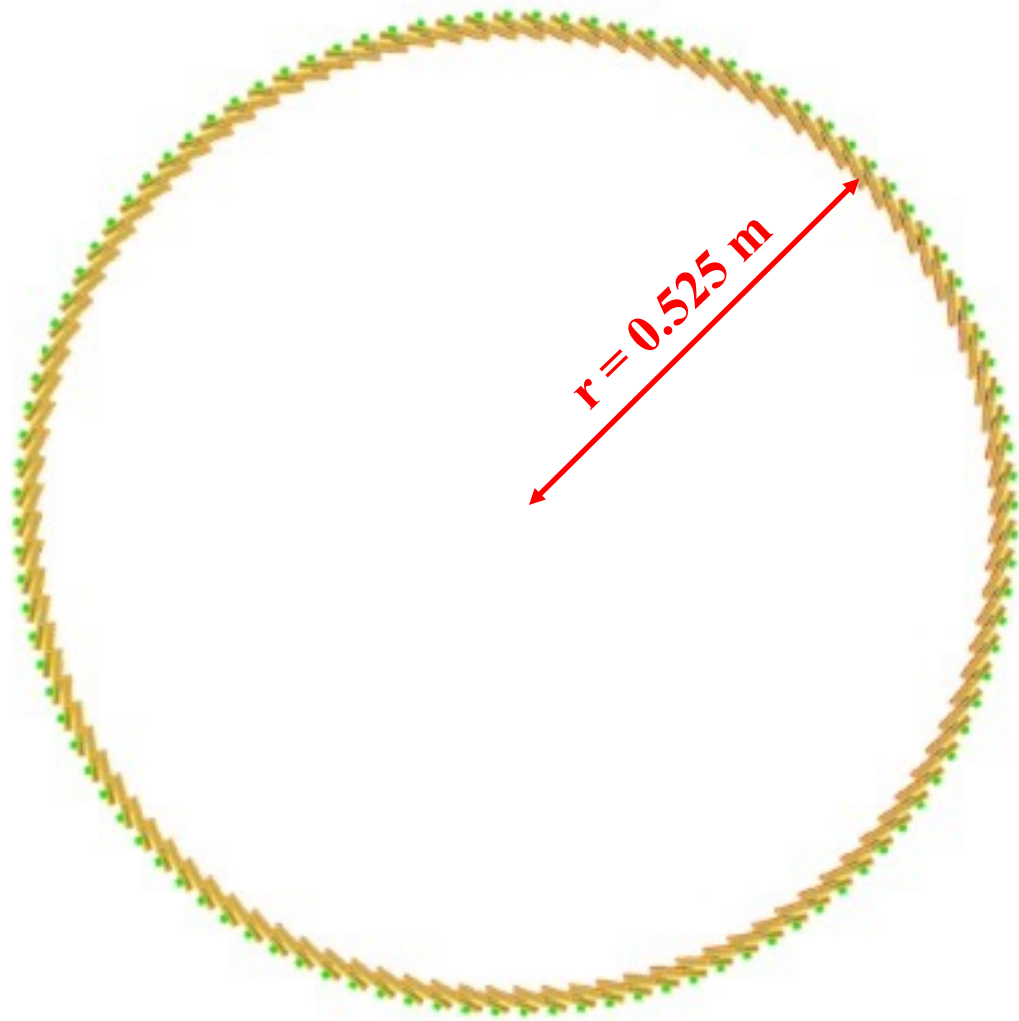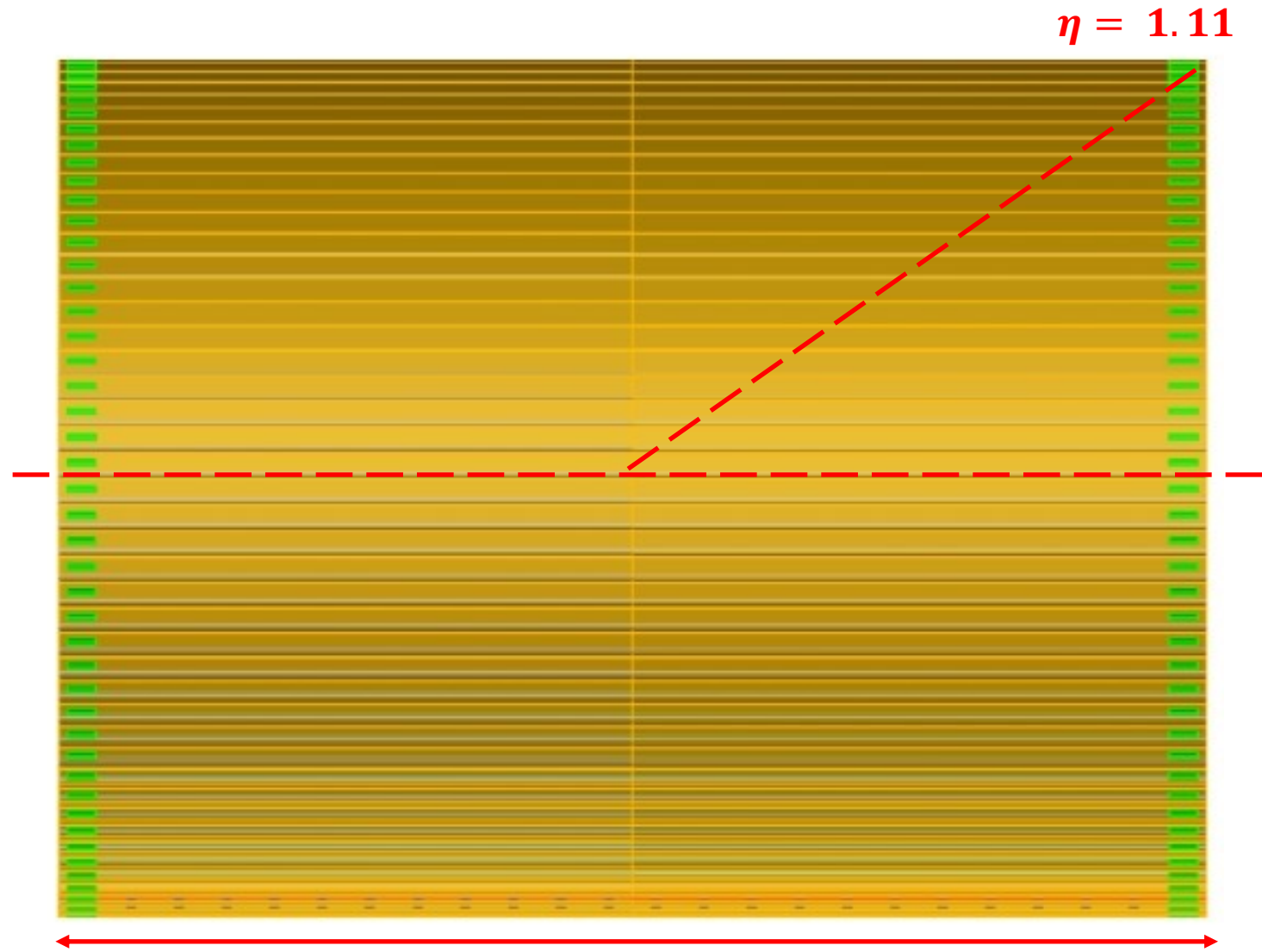
L = 1.3460 m

ATHENA Barrel TOF Module

h=0.642 cm
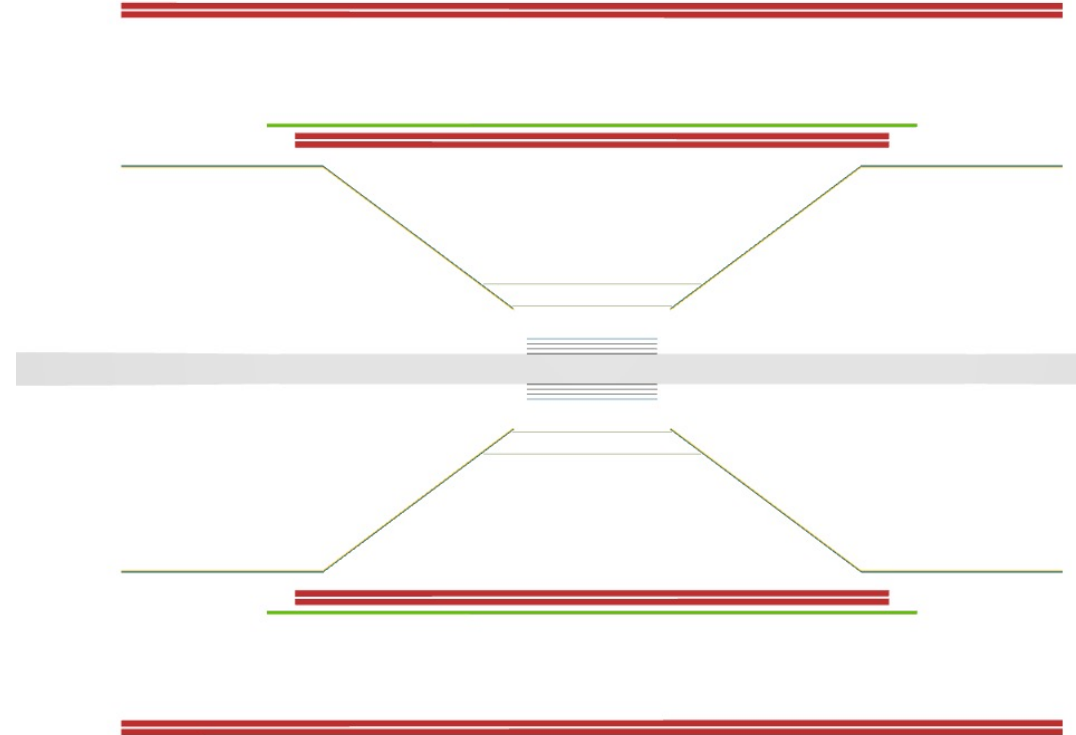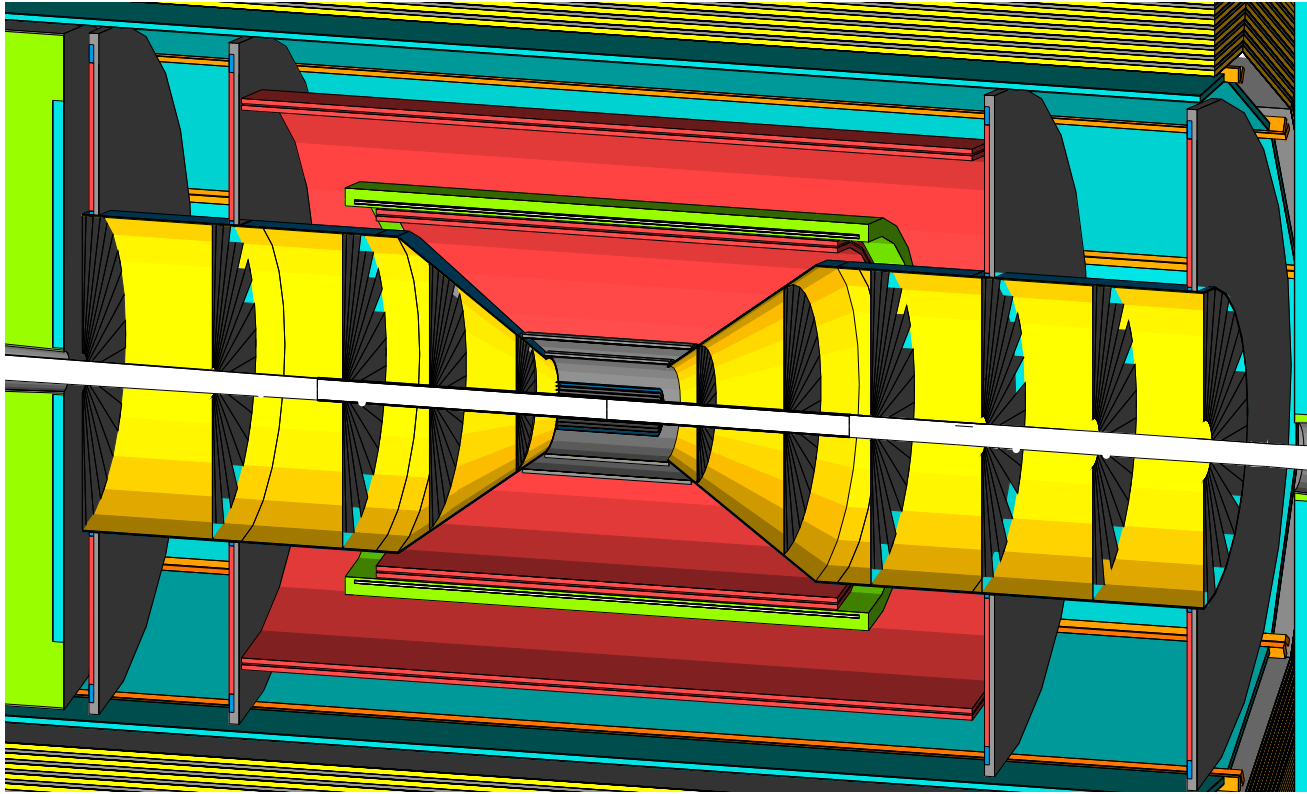
5.5 cm

3.2 cm

w = 5.6 cm

l =½ L = 0.673 m

H=1.242 cm
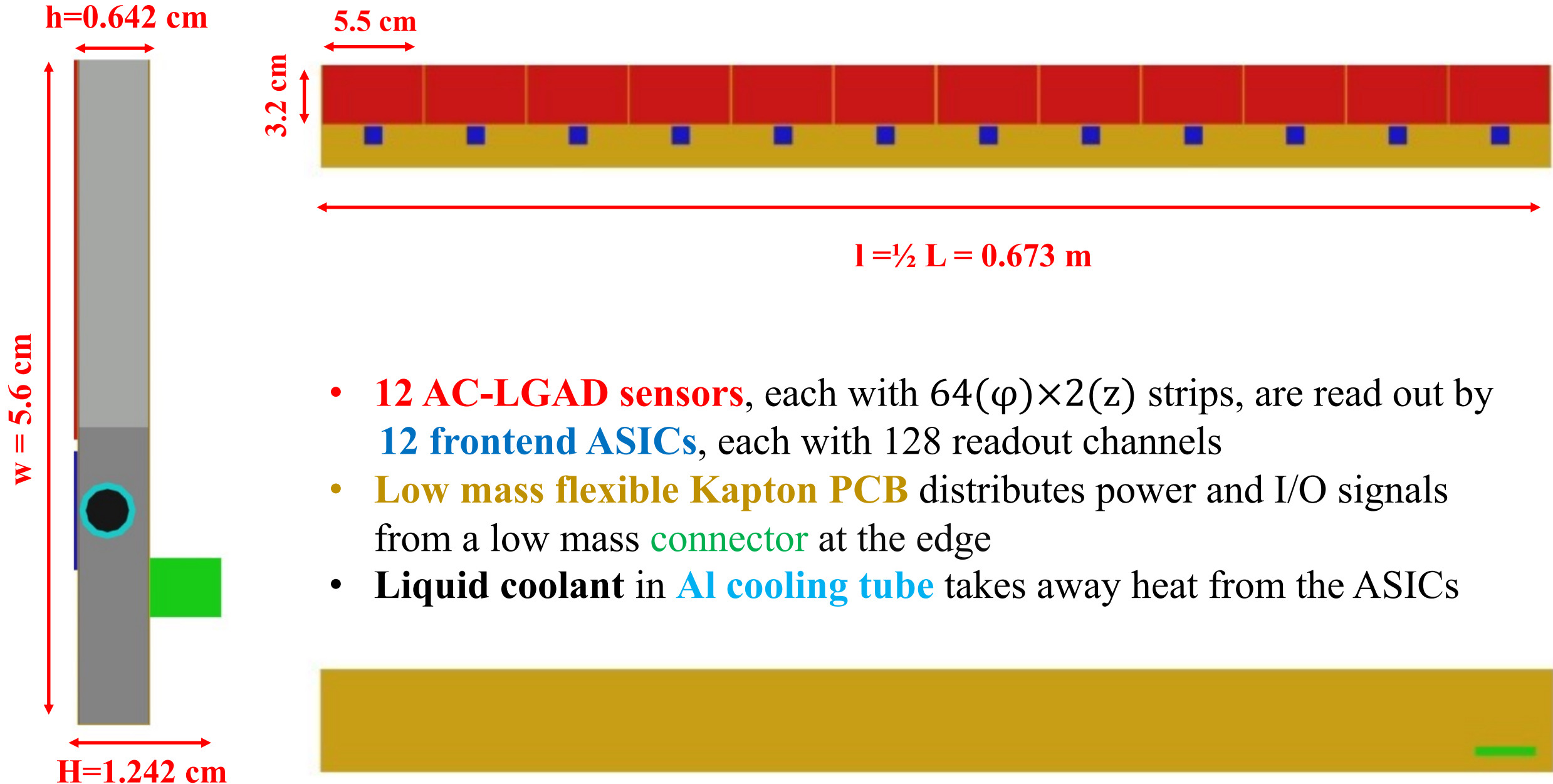
- **12 AC-LGAD sensors**, each with $64(\varphi)\times2(z)$ strips, are read out by **12 frontend ASICs**, each with 128 readout channels
- **Low mass flexible Kapton PCB** distributes power and I/O signals from a low mass connector at the edge
- **Liquid coolant** in **Al cooling tube** takes away heat from the ASICs

ATHENA Barrel TOF in DD4HEP

Zhenyu Ye @ UIC

ATHENA Barrel TOF in DD4HEP

Material Scan (51 cm < rho < 55 cm, -120 cm < z < 120 cm)