Module Design @ last meeting

Preshower, $2X_0$ lead + scintillator

1–1 fiber connectors

11.2mm lead (large sheets)

20mm Sc. (6.25–cm–side hexagons)

Preshower WLS fiber (guided out between EC and the magnet wall)

clear fibers

Shower, $18\ X_0$, Shashlyk (6.25–cm–side hexagons)

100–100 fiber connectors

Shower WLS fibers

5 mm

Photon–rej Scintillator Pad (total 120 segments)

434.5mm (194 layers)

100mm

each layer: 0.5mm Pb+1.5mm Sc+two 0.12–mm gap
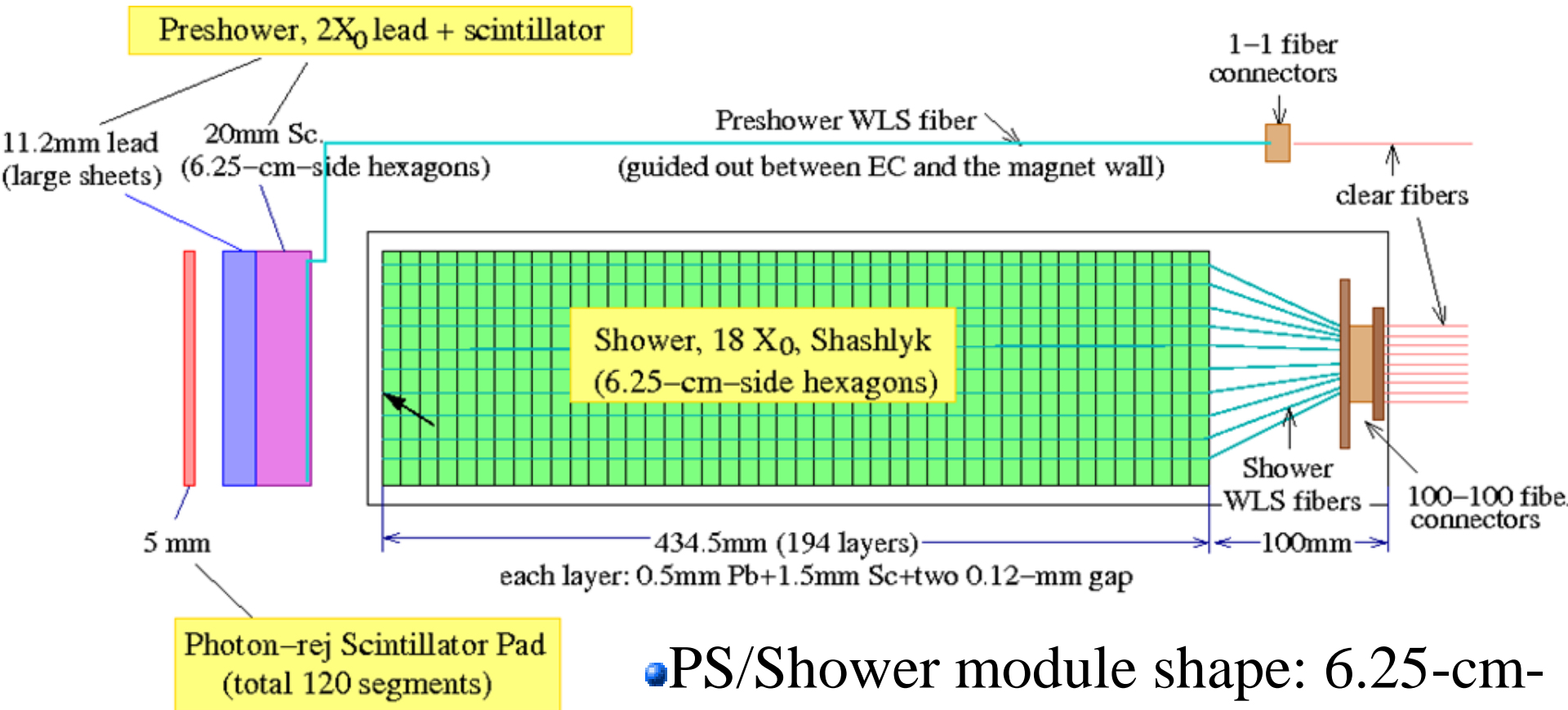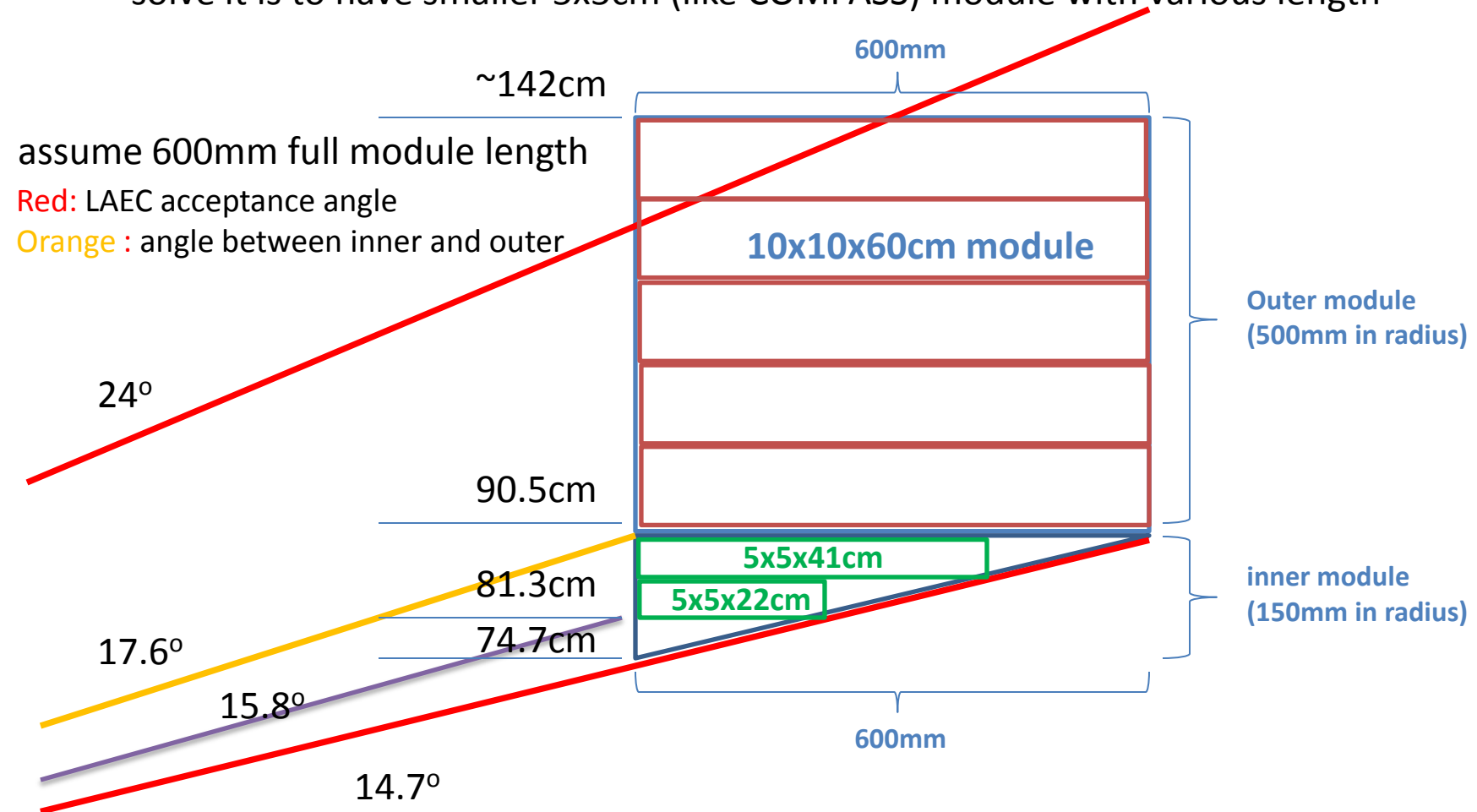
- PS/Shower module shape: 6.25-cm-side hexagons ($100cm^2$)

- SPD: only basic design for SIDIS LAEC, no detailed segmentation

Large Angle EC (side view)
(old with square blocks and 600mm length)

- We want to cover full azimuthal angle and leave no gap between modules, so module can not be tilted and need to be along Z axis
- Prefer having short outer module so that the outer module area can cover more and inner module area can cover less
- Inner module need to be special shape to avoid blocking acceptance. One way to solve it is to have smaller 5x5cm (like COMPASS) module with various length

600mm

~142cm

assume 600mm full module length

Red: LAEC acceptance angle

Orange : angle between inner and outer

10x10x60cm module

Outer module (500mm in radius)

24°

90.5cm

5x5x41cm

5x5x22cm

inner module (150mm in radius)

81.3cm

17.6°

74.7cm

15.8°

14.7°

600mm

Large Angle EC (side view)
(new with hexagon blocks and 500mm length)

- We want to cover full azimuthal angle and leave no gap between modules, so module can not be tilted and need to be along Z axis
- Hexagon layout indent into each other. Layer distance is only half of module thickness 5.5cm=11cm/2
- Inner module need to be special shape to avoid blocking acceptance at forward angle. One way to solve it is to have one layer of 300mm long module which can cover down to 16.3 degree. From 14.85-16.3 degree, LAEC can still accept, but with degraded performance.

assume 500mm module length with active material

angles calculated from SIDIS target center

500mm

~142cm

100x100x500mm module

Outer (~550mm in radius)

24°

88.8cm

83.3cm **100x100x300mm**

17.35°

16.3°

75.6cm

inner (130mm in radius)

14.85°

500mm

12.790
10.000
8.660 11.076