L0 design and prototype testing plan

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INTT group meeting

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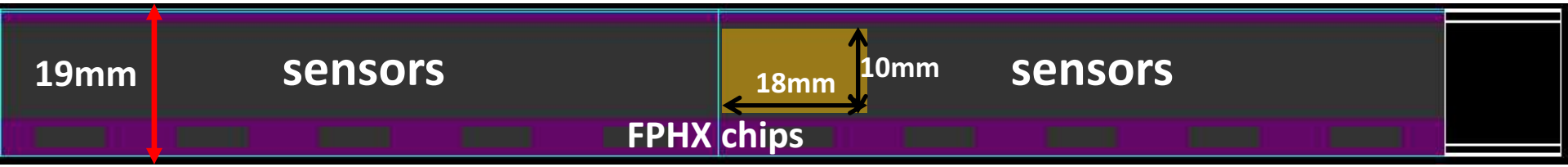
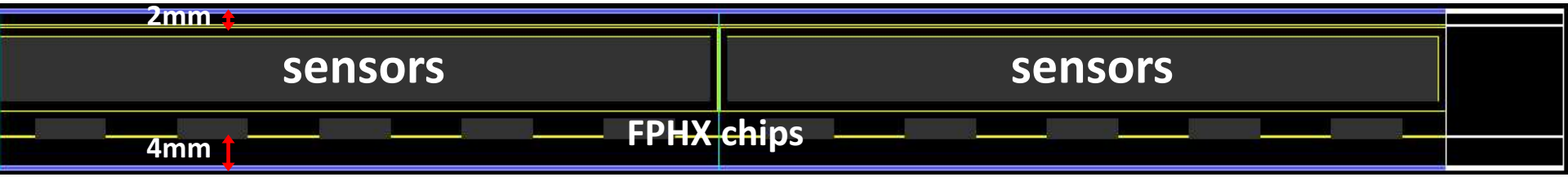
Half-size ladder



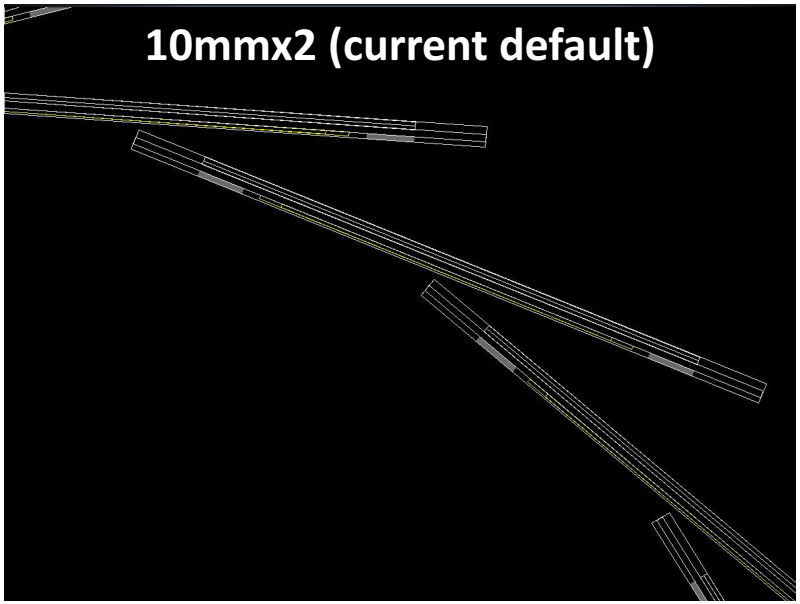
- Fixed total HDI length = 19mm
- Space to sensor from HDI edge = **1.5**mm
- Space to FPHX chip from HDI edge = **1.2-3.2**mm (depending on sensor length 8-10mm)

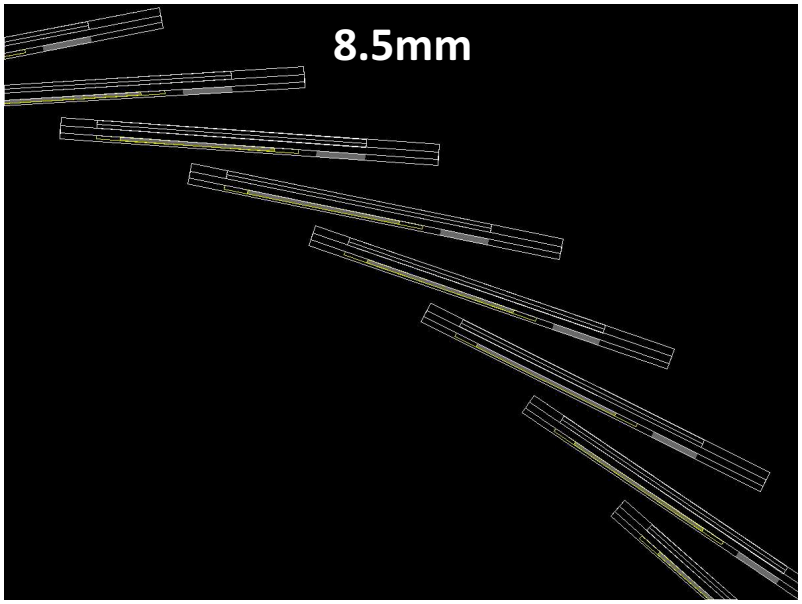


- Space to sensor from HDI edge = **2**mm
- Space to FPHX chip from HDI edge = **4**mm (independent on sensor length)
- Total HDI length = sensor length (8-10mm) + 12.3mm
  - ✓ Spaces at HDI edges(2+4mm) + FPHX chip(2.7mm) + sensor inactive areas(1.305mmx2) + Space between FPHX chip and sensor(1mm) = 12.3mm

Testing sensors

sensor length	ladders	rotation angle (deg)	gap between ladders	overlap (%) for single cell
10mmx2	20	14	0.5mm	10
10mm	48	19.5	1mm	40
9mm	48	19	1mm	25
8.5mm	48	18.5	1mm	15
8mm	48	18	1mm	5

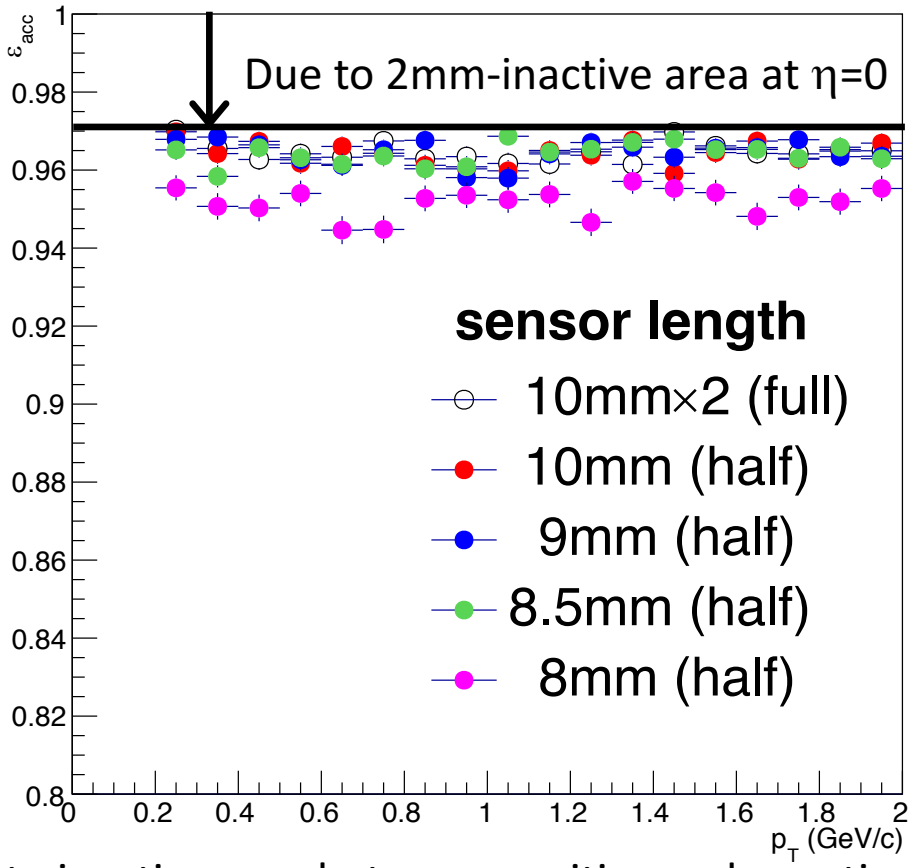




Acceptance

Acceptance = Tracks with "G4hits" at L0/Input tracks

- 50k events: $10e^-$ & $10e^+$ in phi<2π & $|\eta|$<0.5 & Flat pT for 0.2-20GeV/c & zvtx = 0



- 3.2% loss due to inactive area between positive and negative rapidity ladders
  - ✓ Sensor region in $|\eta|$<0.5 = 62.4mm & Inactive region = 2mm
- No pT dependence & comparable acceptance for sensors above 8.5mm

→ 8.5mm sensor looks best to keep maximum acceptance.

Prototype testing plan

- People for prototype test
  - ✓ ~4th week of June: Gaku & Yorito
  - ✓ ~1st week of July: Yorito
  - ✓ ~3rd week of July: Hidekazu & Yorito
  - ✓ ~3rd week of August: Hidekazu & Gaku & Yorito
  - ✓ ~2nd week of September: Gaku (& Student?)
- Testing items
  1. 1st signal check of FPHX chips mounted on HDI using calibration pulses
  2. 2nd signal check of FPHX chips after sensor mounting on HDI, but before wire-bonding with sensor
  3. 3rd signal check of FPHX chips after wire-bonding with sensors
  4. Cosmic ray measurement with self-trigger mode