

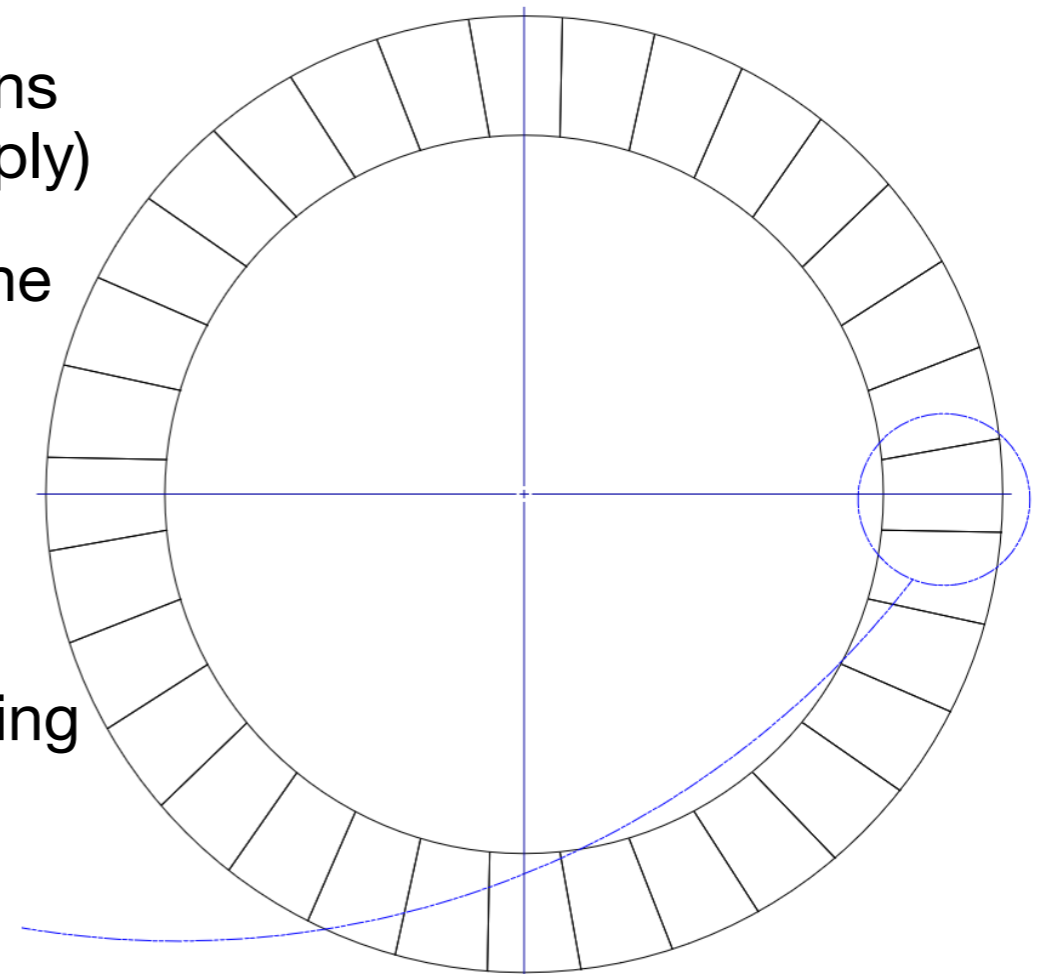
# Cosmic trigger configuration

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# HCal coincidence trigger

- Three different types of HCal cosmic trigger in 2023 cosmic runs
  - Vertical trigger, horizontal trigger, vertical w/ z crossing
    - Vertical trigger: using top & bottom section coincidence
    - Horizontal trigger: using east & west section coincidence
    - Vertical w/ z crossing: same as vertical but require opposite signs of eta.
- The exact sector they block for different sections needs to be confirmed (waiting for Dan Lis's reply)
- In 2024, there are 3 selections on the  $z = 0$  plane requirements.
  - Enforces  $z = 0$  crossing
  - Vetoes  $z = 0$  crossing
  - Either enforces  $z$  crossing nor vetoes  $z$  crossing



VIEW LOOKING NORTH  
EAST HORIZONTAL SECTOR  
32 SECTORS TOTAL

# Some details

- HCal consists of 32 sectors, 48 towers per sector
- The HCAL is divided into two parts ( $0-\pi$  &  $\pi-2\pi$ ) before heading into two separate LL1 trigger.
- The trigger will receive 16 2x2 towers sums of energy in  $\phi$  & 12 2x2 tower sums in  $\eta$
- $|\eta| < 1.1$  is used
- The sector divides into 6 sections in  $\eta$ , when top & down (east & west) fire at same time (within 106 ns, i.e. one beam clock), the coincidence trigger fires
- The horizontal trigger requires  $z = 0$  crossing, while vertical one have some selections on  $z = 0$  crossing

## One HCal sector

