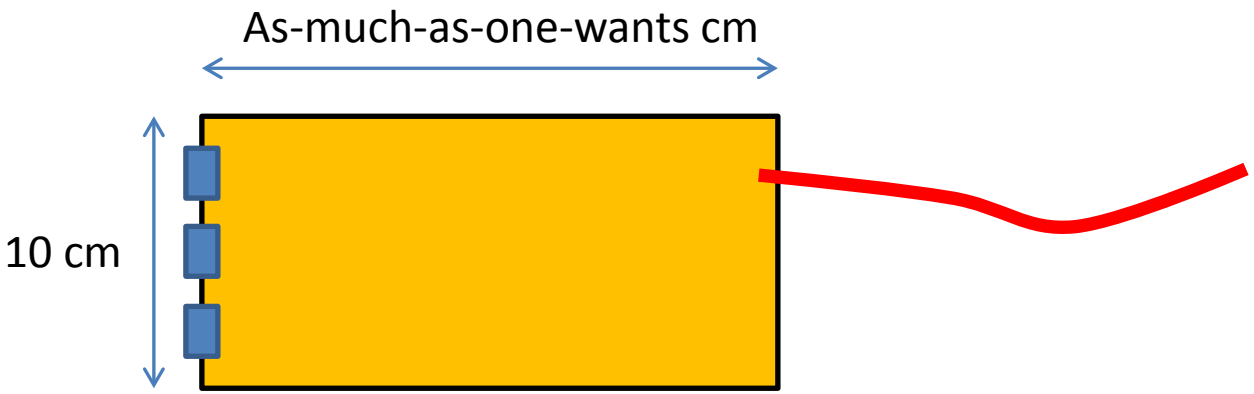
Pads and FEE configuration

Takao Sakaguchi

Consideration

- 200K channel readout from both sides
  - 100K channel per side in 30-90cm radius
- We assume that the FEE cards will be directly attached to pad planes through feedthrough connectors
- Minimum FEE card geometry is assumed
  - 10cm wide for signal input side. No constraint in height.
  - SAMPA chip seems 208pin package → 32mm x 32mm (Including pin length)
  - Almost minimum size for placing two SAMPA chips in parallel on a card



Current pad configuration (John's eng.)

- 14 sectors per side
  - 14286 channels/sector
  - 7143 channels/(sector*side)

- Divide FEE configuration in radius bins of 10cm
  - We assumed 10cm card size
  - Two SAMPA chips on one side of the card
    - → 64 channels/card (32 channels/SAMPA)

- For now, we consider dividing pad planes in bins of 10cm in radius

- Number of channels in the given radius bin (rounded up)
  - 30-40cm: $(40^2-30^2)/(90^2-30^2)*7143= 695$ → 11 cards
  - 40-50cm: $(50^2-40^2)/(90^2-30^2)*7143= 893$ → 14cards
  - 50-60cm: $(60^2-50^2)/(90^2-30^2)*7143= 1092$ → 18 cards
  - 60-70cm: $(70^2-60^2)/(90^2-30^2)*7143= 1290$ → 21 cards
  - 70-80cm: $(80^2-70^2)/(90^2-30^2)*7143= 1509$ → 24 cards
  - 80-90cm: $(90^2-80^2)/(90^2-30^2)*7143= 1711$ → 27 cards

64 channel/card case (STAR iFEE case)

- For 30-40cm radius, we should put 11 cards in on a pad plane
  - Similar for larger radius (a little bit less, but almost no difference)
  - 1.2cm space between cards seems very tight?

- If we make 128 channel/card, the space will be ~2 cm
  - In ALICE, 160 channels/card → 5 cards in our case