Readout Ordering in SVD2

- Strip numbering convention established by SVD offline group in BELLE Note #464
- Readout cannot follow this convention for all ladders.
  - Hybrids are all identical
  - “Strips” readout from right to left across hybrid
- Establish where read out order needs to be inverted to match the offline convention.

William Trischuk, April 16, 2002
Side View \((r-\phi \text{ vs } r-z)\)

- Module **support ribs** at larger \(r\) than **silicon**
- \(p\) side, \(r-\phi\) measurement on surface ‘away’ from beam
- \(n\) side, \(z\) measurement/flex on surface closest to beam

Where two half ladders joined

Backward \(e+\) (3.5GeV)  
Forward \(e-\) (8GeV)
φ Numbering Convention

- Half ladders number in increasing φ
- Starting from forward end at x-axis
- Module 0 in inner layer (intersected by x-axis in this drawing)
- BELLE φ runs counterclockwise here
Readout Order on Hybrids

- This is an FR4 prototype hybrid. Readout ordering is same for final $Al-N$
- **Chip-1** is at the bottom, **Chip-4** is at the top
- Strips are readout from extreme right side of hybrid (readout strip 0) to extreme left side (readout strip 511)
Ordering of $z$-strip Readout

- $z$-flex schematic below (verified CAD drawing has the same layout – just many more lines)
- Lowest numbered chip/strip reads out $z$ strip(s) closest to hybrid – furthest from end of half ladder
Inner Layer viewed from Forward

- φ hybrid outside
  - Strips 0 to 511 readout in same direction as φ
  - Follows BELLE conv.

- z hybrid inside
  - Most positive z strips readout first
  - Follows BELLE conv

- No reordering needed for forward hybrids.
Inner Layer viewed from Backward

- **φ hybrid outside**
  - Strips 0 to 511 readout run against φ
  - Opposite BELLE conv.

- **z hybrid inside**
  - Most negative z strips readout first
  - Opposite BELLE conv

- Strips readout from backward hybrids need reordering.
Summary

- All strips readout from even numbered half ladders (forward end of SVD2)
  - OBEY BELLE SVD NUMBERING CONVENTION
- All strips readout from odd numbered half ladders (backward end of SVD2)
  - VIOLATE BELLE SVD NUMBERING CONVENTION
    NEED RE-ORDERING TO MATCH OFFLINE CONVENTION
- This will be done offline in SVD-COM but L0 and L1.5 trigger need to understand ordering in real time.