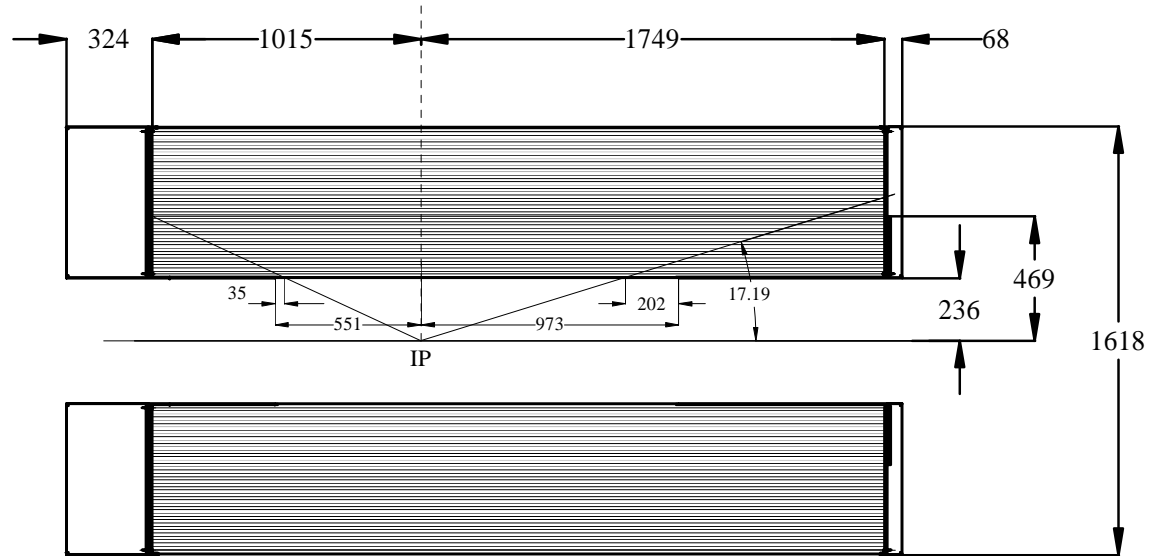




Drift Chamber Structure



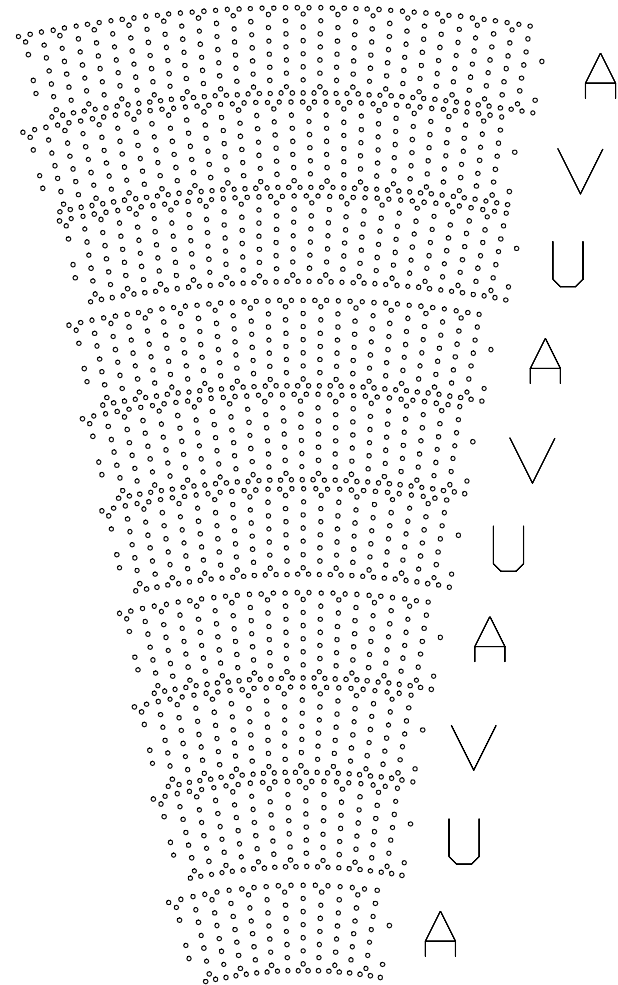
- Flat aluminum rear (24 mm) and forward (24+12 mm) endplates
 - Forward endplate with thin outer section to minimize material
 - Preamplifier and digitizer electronics on rear endplate only
- Load-bearing inner and outer walls to reduce deflections
 - Inner wall of 1 mm-beryllium (40% load)
 - Segmented outer wall of 2x1.5 mm CF skins on Nomex core (60% load)





Drift System Layout

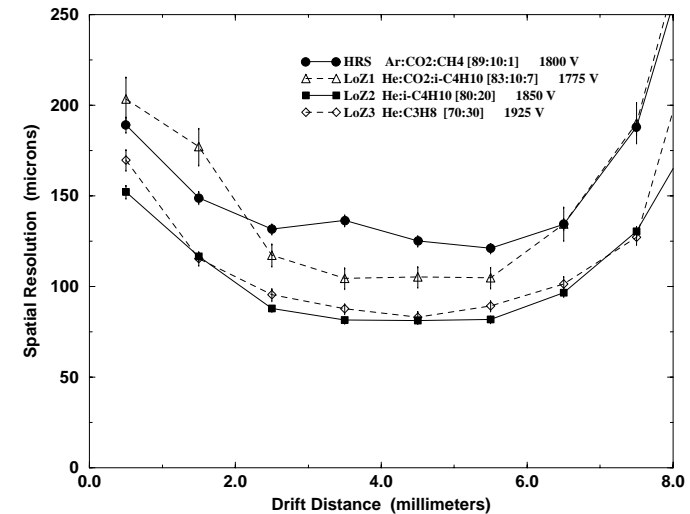
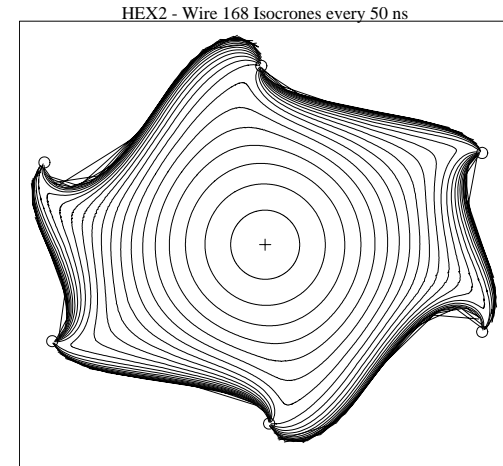
- 40-layer small-cell chamber
 - Cells are 12x18 mm² in size
 - 7104 drift cells with hexagonal field wire pattern
 - 80 and 120 μm gold-plated aluminum field wires
- Layers organized into superlayers with same orientation
 - Wire directions for 4 consecutive layers: axial-u-v-stereo
 - Required for fast reduction of input to Level 1 trigger via segment finding
 - Transition field shaping voltages to maintain reasonably uniform performance





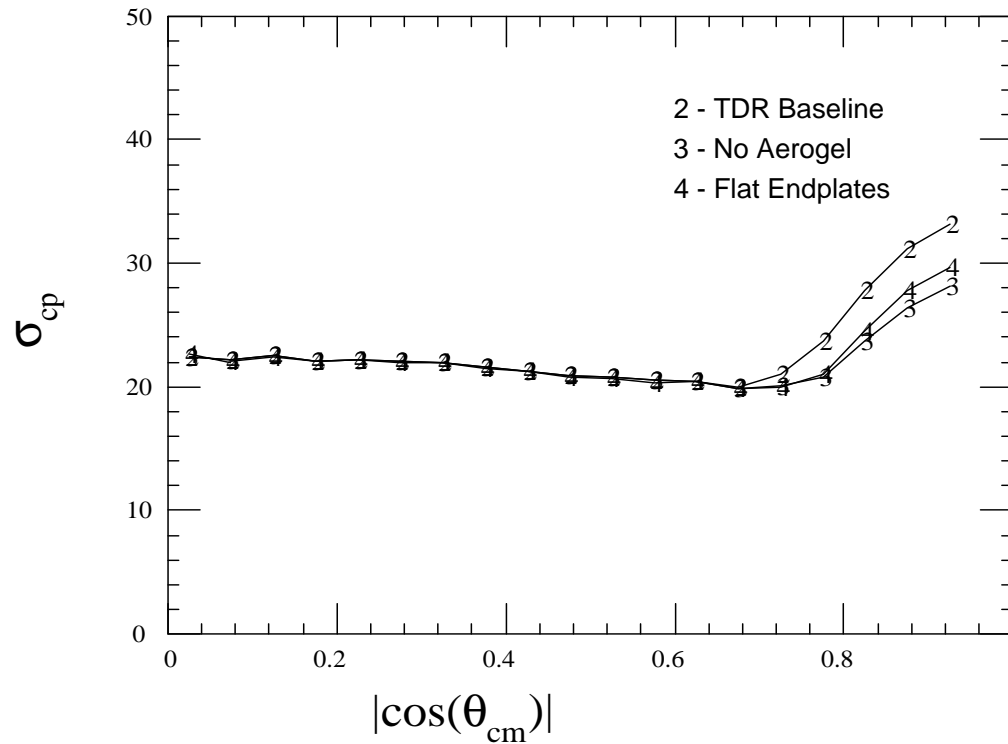
Drift Cell Characteristics

- Nominal 80:20 helium-isobutane gas mixture
 - Low-mass gases able to achieve sub-100 μm position resolutions
 - Low multiple scattering required by soft B decay products
 - dE/dx performance comparable to argon-based mixtures
- Small Lorentz angle should lead to good cell efficiency
 - Modest entrance-angle dependence to STR
- Performance confirmed by measurements with full-length prototype





Drift Chamber Performance



- Expected mass resolution for $B^0 \rightarrow \pi^+\pi^-$ about 22 MeV/c²
 - Nearly uniform over center-of-mass polar angle distribution

