

Second ILC Workshop  
WG5: Superconducting Cavities and Couplers

# Cavity shape

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# BCD: TESLA Shape

- Adequate shape for BCD gradient 35 MV/m.
- Extensive tests and experiences exist:
  - \* 35 MV/m demonstrated with beam.
  - \* HOMs, wakefields well studied.
  - \* over 80 cavities fabricated.
  - \* 40 cavities running in TTF.
  - \* 1000 cavities to be built for XFEL.
- R&D should focus on fabrication and process improvements to produce 35 MV/m reproducibly.

# ACD: LL shape & RE shape

- Choice for higher gradient capability of 45-50 MV/m.
- 47 MV/m with  $Q$   $1e10$  achieved in two single cell Cornell RE cavities processed/tested respectively at Cornell and KEK.
- Strong R&D must continue to build and test 9-cell LL and RE cavities. KEK has built four 9-cell LL cavities. Cornell 9-cell RE cavities plan underway.
- R&D of field emission suppression is priority.
- Some new shapes have smaller iris diameter. Impacts need asses. Allowable iris diameter should be determined (help from other WG's needed).

# ACD: LL shape & RE shape

- Recommended criterion based on technical potential for justifying ACD shape to take over BCD shape is six new shape cavities of  $> 45$  MV/m at  $Q$  of  $\geq 0.5E10$  (CW or pulsed).
- Recommended criterion based on cost saving for justifying ACD shape to take over BCD shape is achieving 35 MV/m at  $Q$  of  $1E10$  with a better yield than BCD shape.
- Editorial note-H Edwards, I do not agree- new shapes must be tested in multi cavity modules with beam and show that they meet HOM and Darkcurrent specifications as well as Grad &  $Q$