Simulation of multipacting in ILC 1.3 GHz cavity HOM coupler

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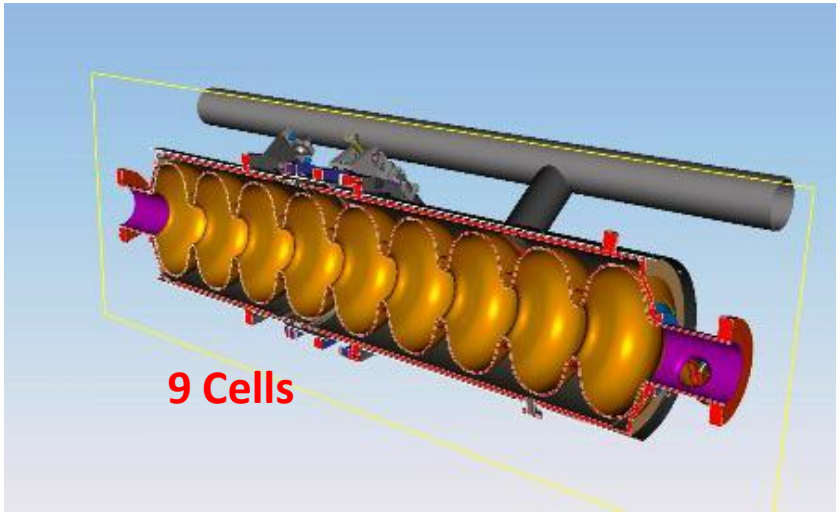
SRF Cavity

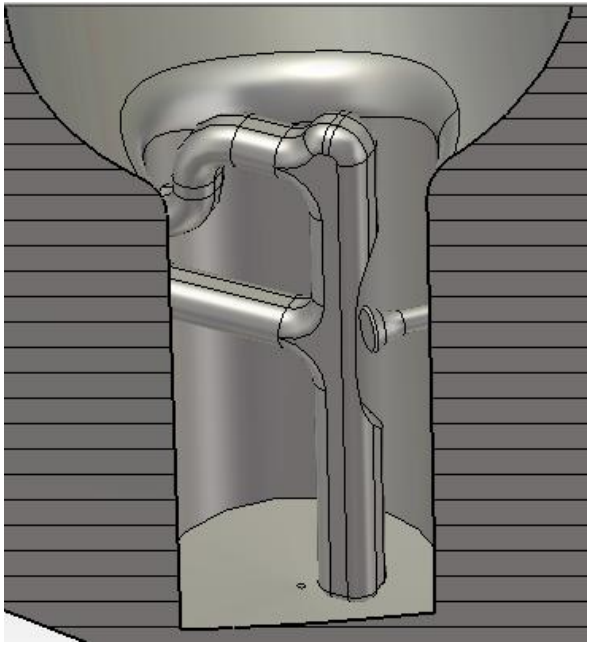
- ILC 1.3 GHz cavity



- Material: Nb

HOM Coupler

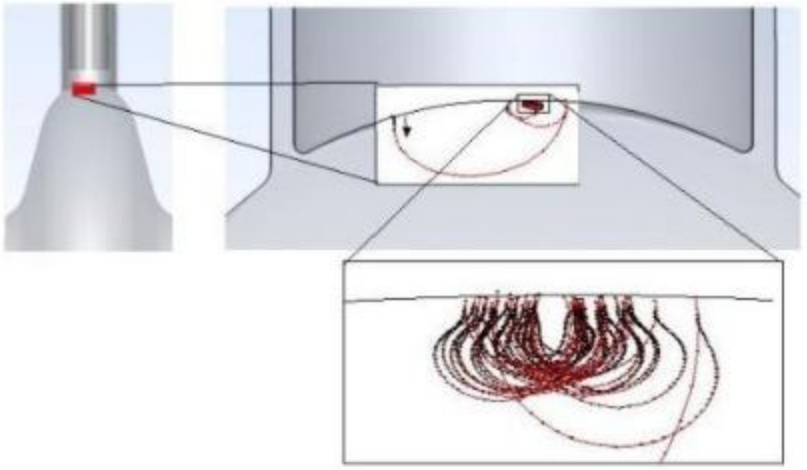
- High order modes do exist in the cavity
- They lead to emittance dilution
- HOM coupler is designed to suppress them



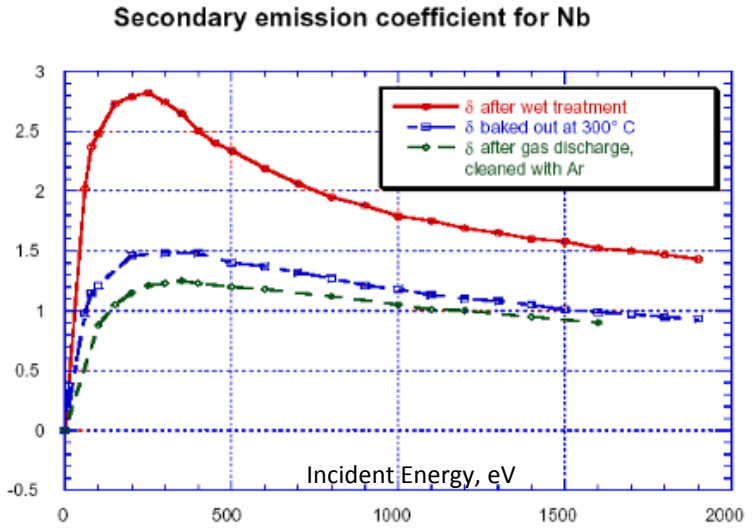
- Problem: it heats

Multipacting

- Number of particles increases exponentially
  - Doesn't let to achieve strong fields
  - Causes HOM to heat



- 2 Conditions:
  - Secondary Yield greater than 1
  - Resonance



My plans

- What am I going to do?

  Run numerical simulations to find out under what conditions multipacting occurs.

- How am I going to do that?

  0) Get acquainted with simulation programs:
  CST Studio, Analyst, etc.

  1) Eigenmode problem -> Field distribution

  2) Particle tracking -> zones of multipacting