

# WG5 On Gradient and Cavity

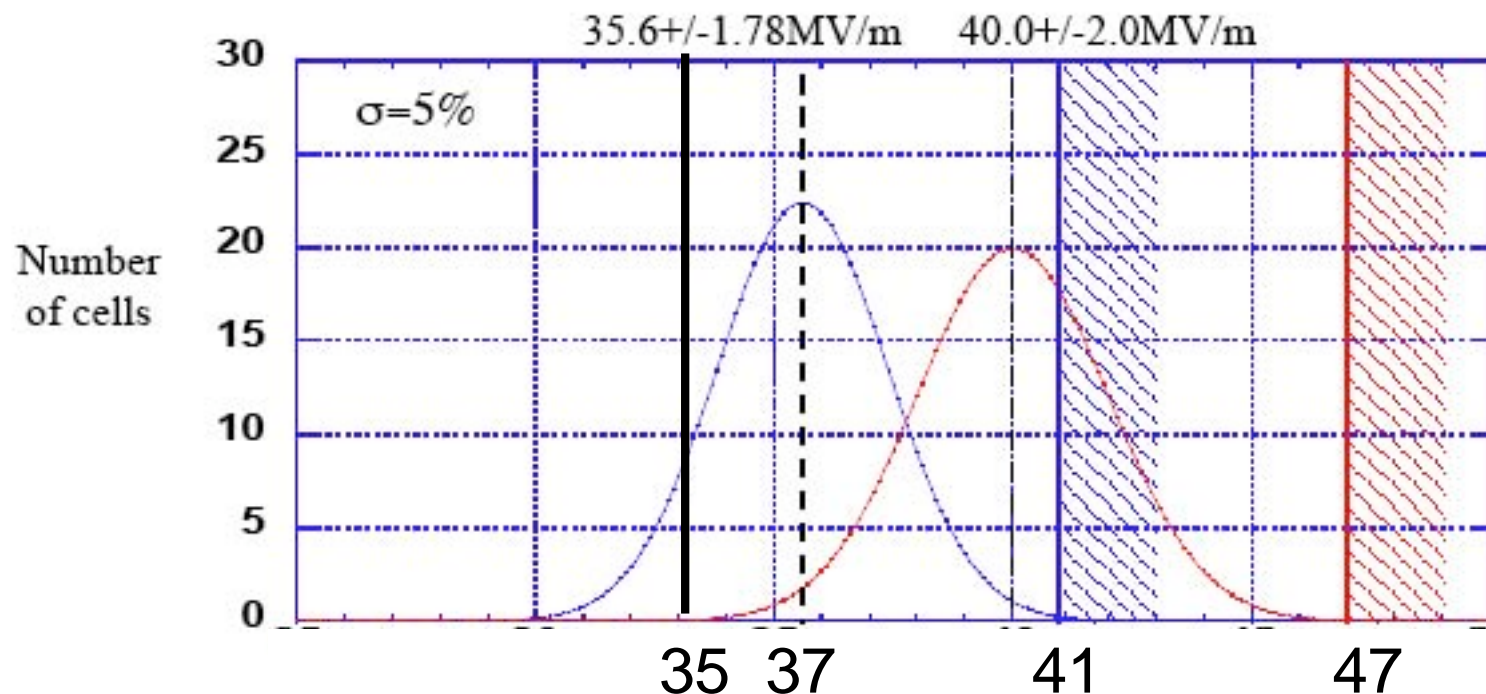
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# Upgrade strategy

- We choose one gradient for 500
  - BCD Tesla shape,
  - ACD LL/RE
- We choose another for the upgrade half of the machine for 1TeV
  - BCD LL or RE

Assume cavities can reach avg of 90%  
of limit with 5%rms in Vert dewar  
(The plot distributions show 85%)

Most Tesla cavities should be able to reach 35MV/m accept  
Most LL/RE cavities should be able to reach 40 MV/m accept  
But note there is a low energy tail that fails



# Production Sequence

- Assume that cavities that go in modules have passed vert acceptance but are not selected further. They go into modules and into tunnel
- Some of these cavities will not reach the acceptance value
- Assume that fluctuations of 10% (full width) can be accommodated by the rf so there is no operating penalty

# Operating margin?

How much head room does one need between nominal installed grad and operating gradient?  
(not overhead for failures trips etc)

- Should this be zero as in previous example?
- Or 10%, or ??? Some say 5%
- If 10%
- Tesla 31.5MV/m, LL/RE 36MV/m
- Model 1

500Gev 31.5MV/m 500Gev 36MV/m

Could this 10% be the same 10% as needed for  
Overhead?

# Summary BCD 500 Tesla Shape

- Operating in Linac 500GeV
  - Max 31.5MV/m (10% oper margin) (and installed length)
  - $Q\ 1e10$
- Installed gradient & rf power
  - 35 MV/m
  - $Q\ 0.5e10$
- Vert Dewar Accept
  - $>35\text{MV/m}$
  - $Q\ .5\ \text{to}\ .8e10$
  - Darkcurrent
- R&D Goals
  - $\geq 37\text{MV/m}$  avg (10% lower than critical)
  - Spread rms 5%
  - $>Q\ 5e9$
  - Darkcurrent-

# Summary ACD 500 LL/RE Shapes

- Operating in Linac
  - Max 36 MV/m (10% overhead)
  - Q 1e10
- Installed grad
  - 40MV/m
  - Q 0.5 e10
- Vert Dewar Accept
  - 40MV/m
  - Q .5 to .8e10
- R&D Goals
  - 42MV/m (10% lower than critical)
  - Spread rms 5%
  - Q 5e9
  - Darkcurrent-