WG5 On Gradient and Cavity

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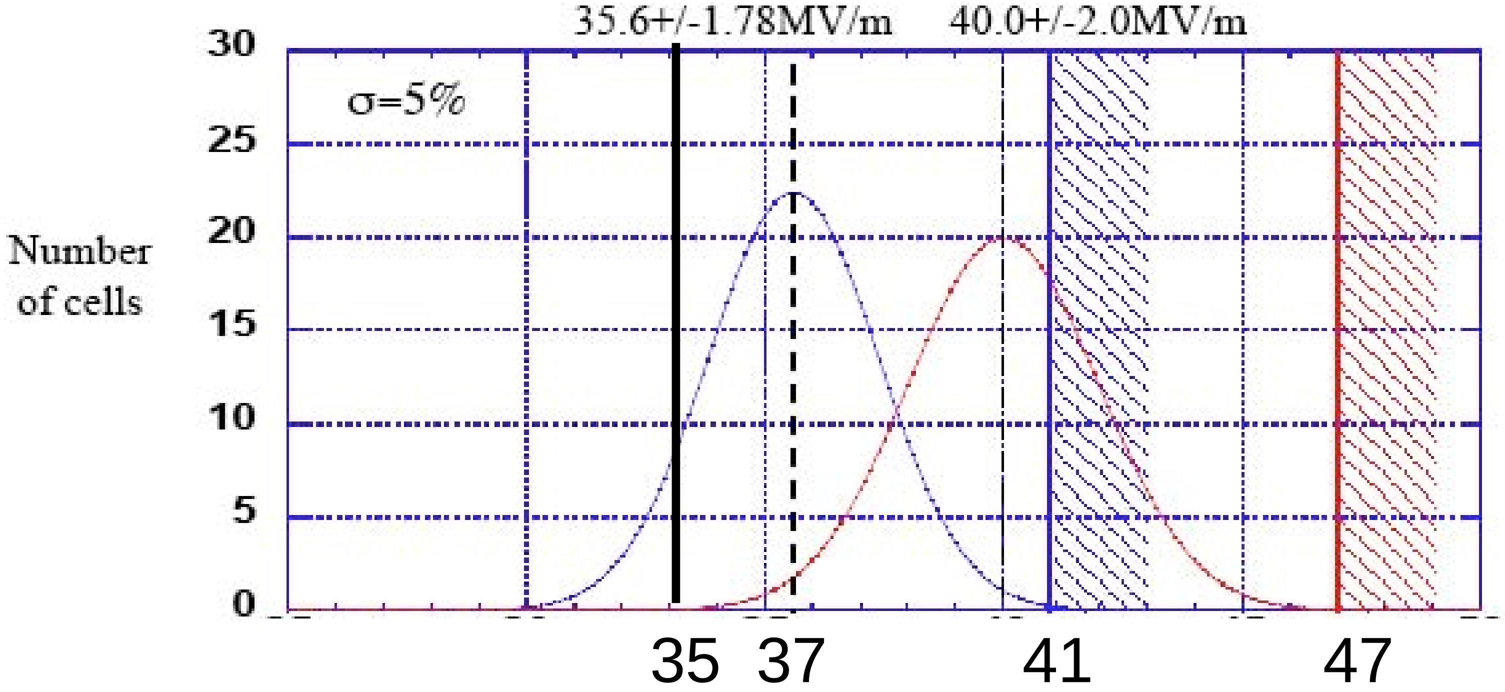
Upgrade strategy

- 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 margine?

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
  - >35MV/m
  - Q .5 to .8e10
  - Darkcurrent
- R&D Goals
  - >=37MV/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-