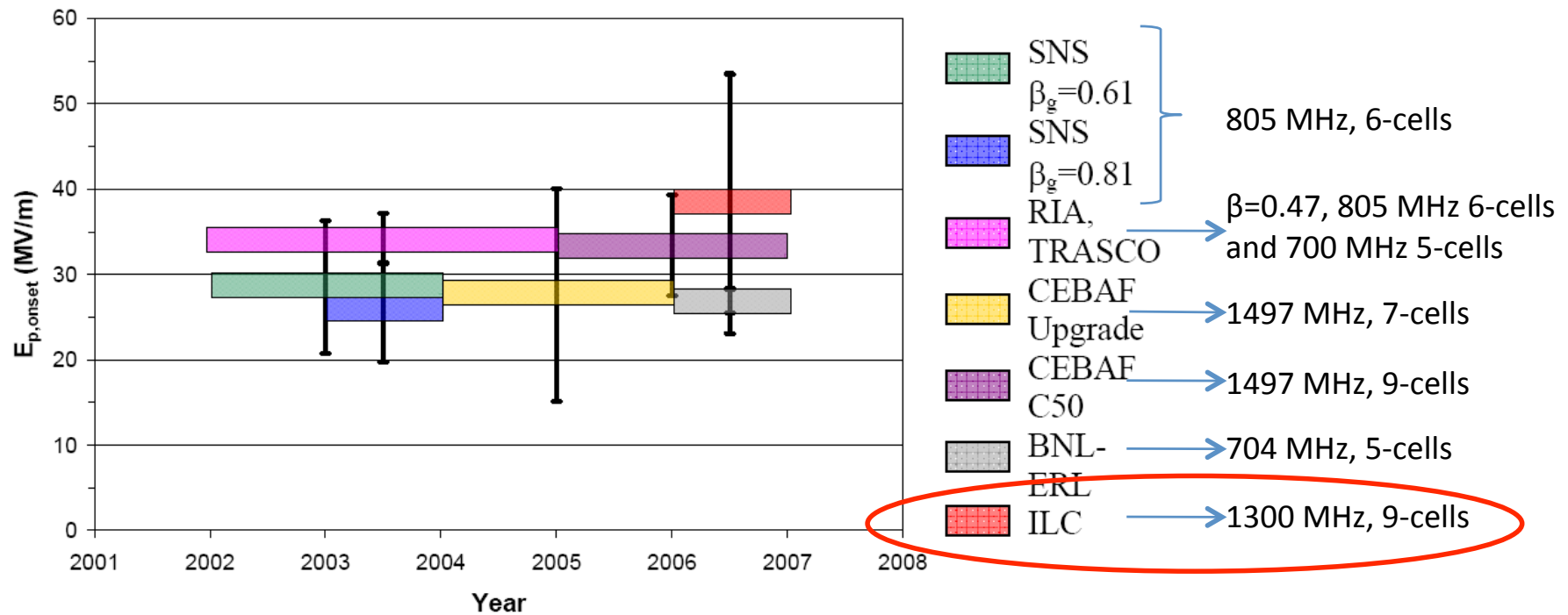


Peak E for field emission onset (JLAB)



EP + 120 C / 48h bake

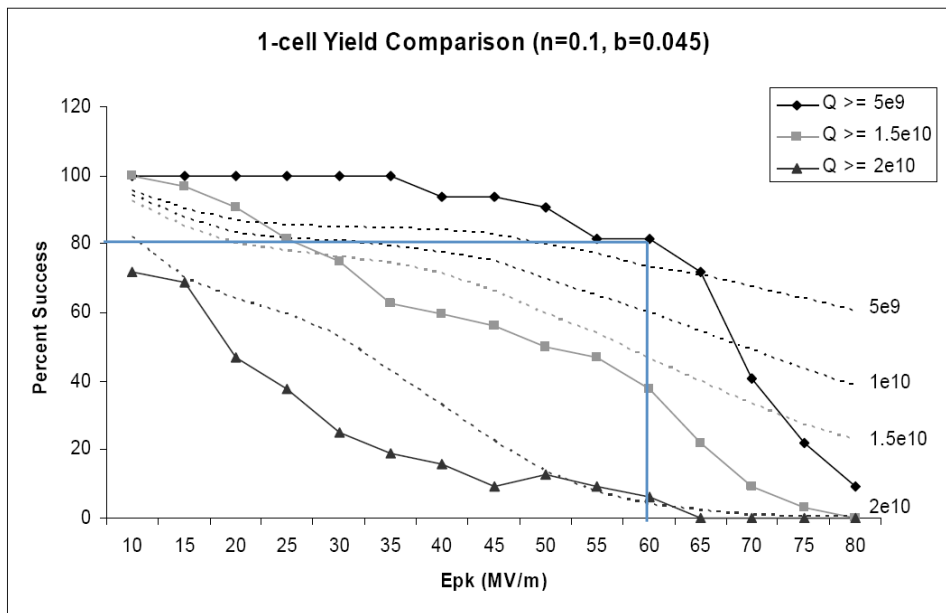
From G. Ciovati, JLAB
Priv. comm.

Ep, onset & Ep, max

Year	Project	β_g	$E_{p,onset}$ (MV/m)	$E_{p,max}$ (MV/m)	$Q_0(E_{p,max})$ (10^9)	No. cavities	% tests with FE
2002/05	RIA, TRASCO	0.47	34.3 ± 2.9	46.9 ± 5.5	6.5 ± 4.2	6	100
2002/04	SNS	0.61	28.5 ± 7.8	40.3 ± 7.8	4.0 ± 1.3	35	86
2003/04	SNS	0.81	25.5 ± 5.8	40.1 ± 8.1	5.2 ± 2.8	48	96
2004/06	CEBAF Upgrade	1	27.6 ± 12.5	41.6 ± 7.8	4.9 ± 1.0	8	49
2005/07	CEBAF C50	1	33.4 ± 5.9	36.8 ± 8.5	8.1 ± 3.1	65	51
2006/07	BNL- ERL	1	26.9 ± 1.4	42.2 ± 7.9	6.0 ± 2.9	1	70
2006/07	ILC	1	38.3 ± 15.2	50.8 ± 13.7	9.8 ± 3.2	7	74

From G. Ciovati, JLAB
Priv. comm.

1 cell vs. 9 cells 1.3 GHz (DESY)



Figures 5: Simulated vs. observed yield profiles for 1-cells

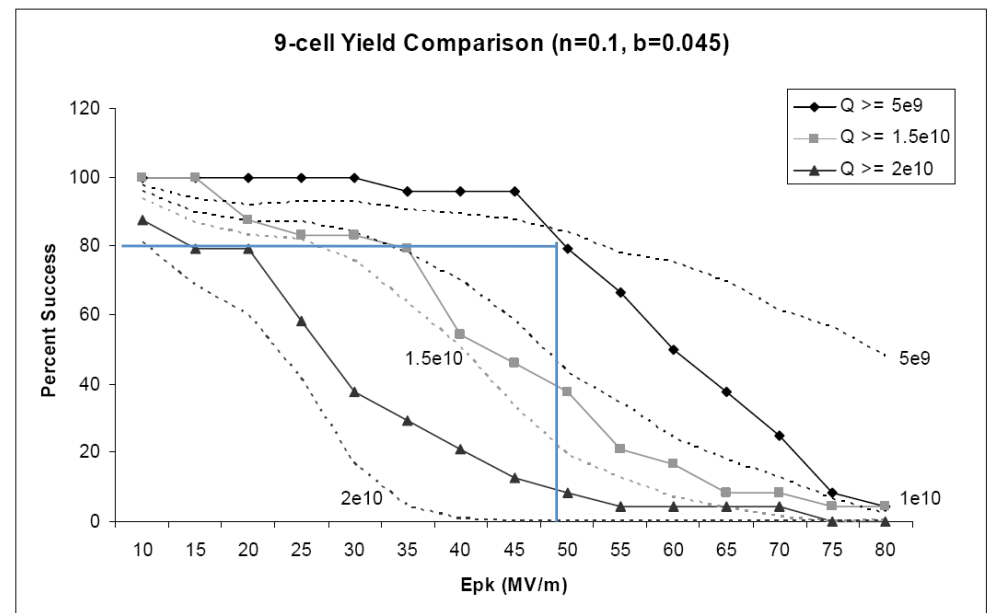


Figure 6: Simulated vs. observed yield profiles for 9-cells

From TESLA report 2008-02
J. Wiener, H. Padamsee

My conclusion (preliminary)

- JLab experience:
 - On all cavities prepared by BCP (various frequencies, beta, # of cells)
 - ~31 MV/m average f.e. onset surface field, ~44 MV/m average peak surface field
 - total surface of cavities does not seem to play a role
 - On all cavities prepared by EP + low-temp baking
 - ~38 MV/m average f.e. onset surface field, ~51 MV/m average peak surface field
 - EP+bake guarantee ~20 % higher fields
- DESY experience:
 - On all cavities prepared by EP + low-temp baking
 - 50÷60 MV/m average f.e. onset surface field, no clear average number for peak surface field
 - 1-cell or 9-cells seem not to show different results
 - DESY results 40% better than JLab (due to better infrastructure and operating procedure?)
 - Success rate
 - for example: 80% of cavities have a peak surface field of at least x MV/m for a given Q value. 1-cell cavities show 20% larger field than 9-cells cavities (~60 MV/m instead of ~50 MV/m at Q=5E9)
 - Better success rate for 1-cell than for 9-cells (depends on total surface?)

To be verified

- Statistical model from Padamsee et al. for DESY cavities
 - Try to implement to the SPL case if feasible (ongoing).
- BCP'ed cavities have 20% lower fields than EP'ed cavities at JLab
 - Investigate if this is also true at DESY (tbd).
- DESY's operating procedure seems to provide better results than JLab's
 - Why?
- Understanding the above will help in optimise SPL parameters choice.