

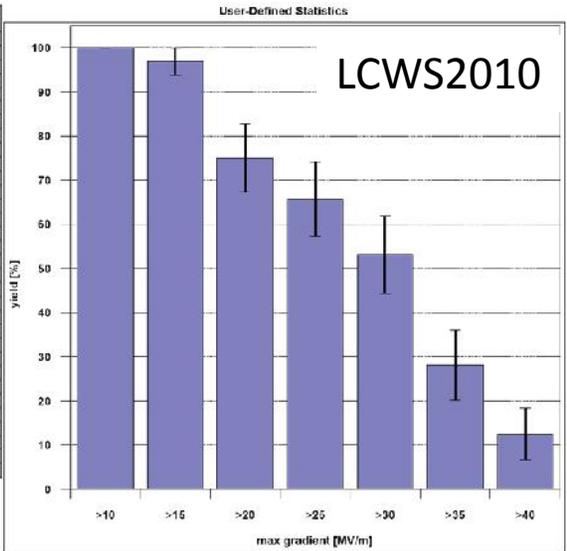
# ILC Cavity Performance Evaluation TDP/R&D plan release 5

C.M. Ginsburg  
On behalf of the ILC Database Group

SCRF WebEx Meeting  
June 30, 2010

# 1<sup>st</sup> pass (detail)

No.	Cavity	Test Date	Max. Elec [MV/m]
1	TB9ACC013	01.Dec.08	41.80
2	TB9ACC014	09.Feb.09	41.50
3	TB9AES008	26.Aug.09	41.10
4	TB9AES007	16.Mar.10	41.00
5	AC122	26.Aug.08	38.88
6	AC115	11.Dec.07	38.60
7	TB9RJ019	06.Nov.09	37.70
8	TB9ACC011	21.Aug.08	37.00
9	TB9ACC012	07.Jul.08	35.10
10	Z134	13.Nov.09	34.94
11	AC125	15.Jun.08	34.59
12	AC150	30.Jan.09	34.33
13	TB9AES009	18.Aug.09	33.40
14	Z143	09.Oct.08	32.57
15	Z106	21.Feb.07	31.70
16	AC127	13.Feb.09	31.25
17	TB9ACC016	14.Dec.09	31.20
18	ACCEL7	05.Sep.06	29.00
19	AC149	28.Jan.09	26.51
20	AC124	05.Feb.09	26.01
21	Z137	24.Feb.09	25.23
22	Z139	12.Sep.08	24.93
23	Z142	01.Jul.09	20.58
24	TB9AES005	27.Mar.09	20.50
25	AC118	17.Dec.06	19.00
26	Z141	16.Apr.08	18.29
27	TB9ACC015	02.Jul.08	18.00
28	Z132	19.Aug.08	16.83
29	Z131	20.Aug.08	17.17
30	Z132	19.Aug.08	16.83
31	AC126	05.Sep.08	16.37
32	TB9AES006	09.Apr.09	14.10



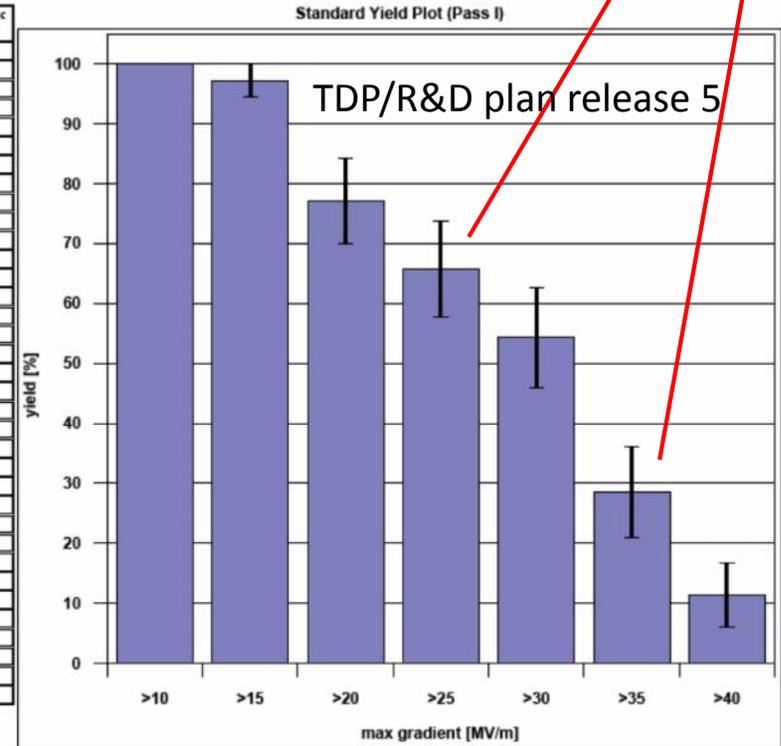
1st-pass cavity yield at >25 MV/m is (66 ± 8) %

(66 ± 8) %

>35 MV/m is (28 ± 8) %

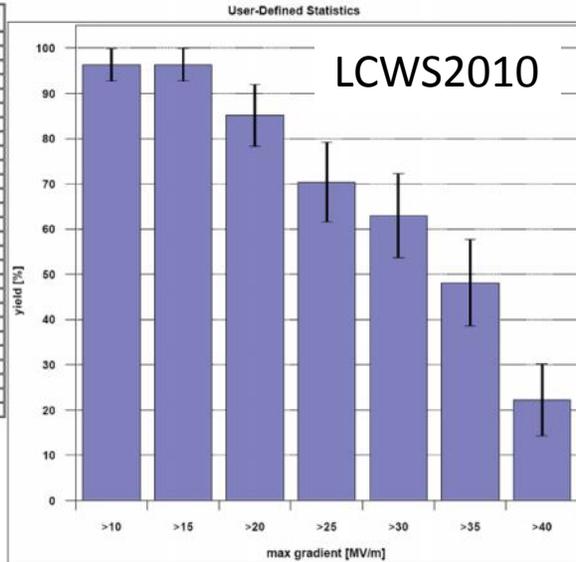
(29 ± 8) %

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4	TB9AES007	16.Mar.10	41.00
5	AC122	26.Aug.08	38.88
6	AC115	11.Dec.07	38.60
7	TB9RJ019	11.Jun.10	38.00
8	TB9AES010	06.Nov.09	37.70
9	TB9ACC011	21.Aug.08	37.00
10	TB9ACC012	07.Jul.08	35.10
11	Z134	13.Nov.09	34.94
12	AC125	15.Jun.08	34.59
13	AC150	30.Jan.09	34.33
14	TB9AES009	18.Aug.09	33.40
15	TB9RJ018	15.Apr.10	33.10
16	Z143	09.Oct.08	32.57
17	Z106	21.Feb.07	31.70
18	AC127	13.Feb.09	31.25
19	TB9ACC016	14.Dec.09	31.20
20	ACCEL7	05.Sep.06	29.00
21	AC149	28.Jan.09	26.51
22	AC124	05.Feb.09	26.01
23	Z137	24.Feb.09	25.23
24	Z139	12.Sep.08	24.93
25	AC146	06.May.10	23.63
26	Z142	01.Jul.09	20.58
27	TB9AES005	27.Mar.09	20.50
28	ACCEL6	12.Dec.06	19.00
29	Z141	16.Apr.08	18.29
30	TB9ACC015	02.Jul.08	18.00
31	Z130	01.Sep.08	17.30
32	Z131	20.Aug.08	17.17
33	Z132	19.Aug.08	16.83
34	AC126	05.Sep.08	16.37
35	TB9AES006	09.Apr.09	14.10



# 2<sup>nd</sup> pass (detail)

No.	Cavity	Test Date	Max. Eacc [MV/m]
1	TB9ACC013	01.Dec.08	41.80
2	TB9ACC014	09.Feb.09	41.50
3	ACCEL7	18.Jun.07	41.20
4	TB9AES008	16.Aug.09	41.10
5	Z143	12.Nov.08	41.00
6	TB9AES007	16.Mar.10	41.00
7	TB9ACC016	11.Feb.10	39.30
8	AC122	26.Aug.08	38.88
9	AC115	11.Dec.07	38.60
10	TB9AES010	06.Nov.09	37.70
11	TB9ACC011	21.Aug.08	37.00
12	TB9AES009	07.Oct.09	36.00
13	TB9ACC012	07.Jul.08	35.10
14	AC150	08.May.09	33.23
15	Z139	20.Oct.08	32.75
16	Z106	27.Feb.07	31.50
17	AC124	19.May.09	30.93
18	ACCEL6	23.Jun.07	29.00
19	AC127	11.Jun.09	27.85
20	AC149	05.May.09	23.27
21	TB9AES006	11.Sep.09	22.20
22	Z141	14.May.08	20.70
23	TB9AES005	09.Apr.09	20.50
24	TB9ACC015	14.Jul.08	19.00
25	Z131	25.Nov.08	17.96
26	Z130	15.Oct.08	16.60
27	AC126	21.Oct.08	6.14



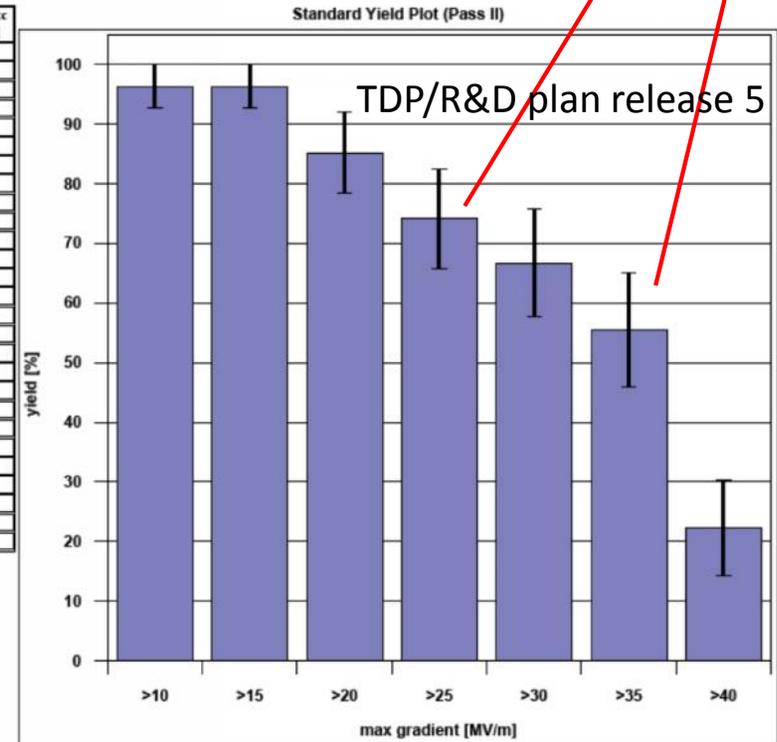
2nd-pass cavity yield at >25 MV/m is (70 +/- 9) %

(74 +/- 8) %

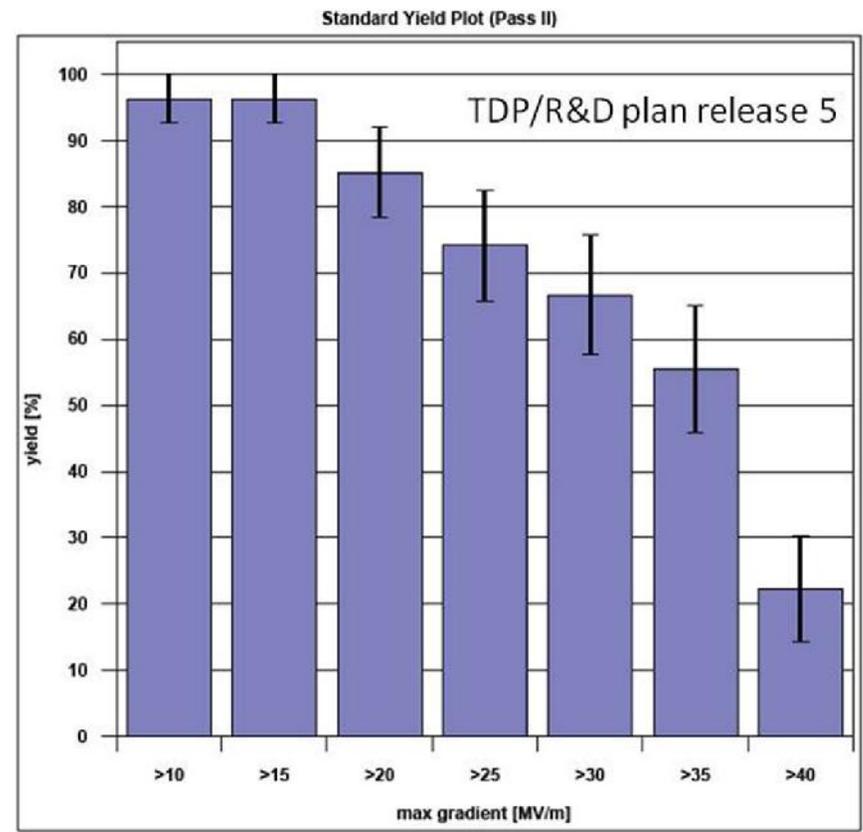
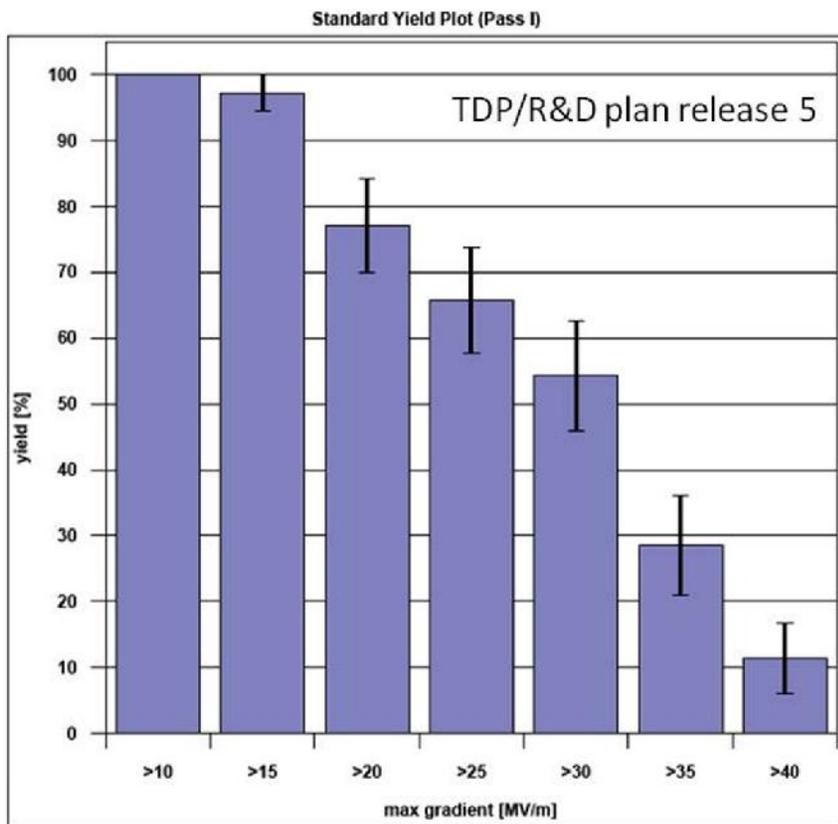
>35 MV/m is (48 +/- 10) %

(56 +/- 10) %

No.	Cavity	Test Date	Max. Eacc [MV/m]
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3	ACCEL7	18.Jun.07	41.20
4	TB9AES008	26.Aug.09	41.10
5	TB9AES007	16.Mar.10	41.00
6	Z143	12.Nov.08	41.00
7	TB9ACC016	11.Feb.10	39.30
8	TB9RI018	02.Jun.10	39.00
9	AC122	26.Aug.08	38.88
10	AC115	11.Dec.07	38.60
11	TB9RI019	11.Jun.10	38.00
12	TB9AES010	06.Nov.09	37.70
13	TB9ACC011	21.Aug.08	37.00
14	TB9AES009	07.Oct.09	36.00
15	TB9ACC012	07.Jul.08	35.10
16	AC150	08.May.09	33.23
17	Z139	20.Oct.08	32.75
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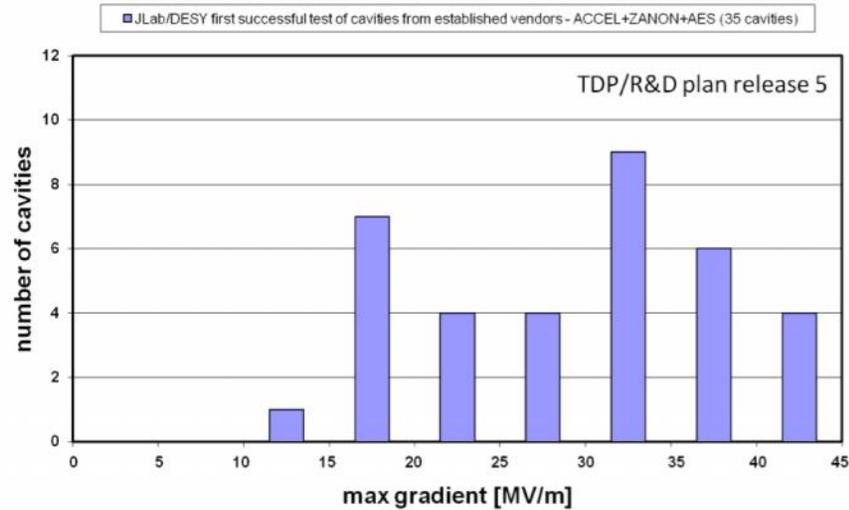


# Plots for the document

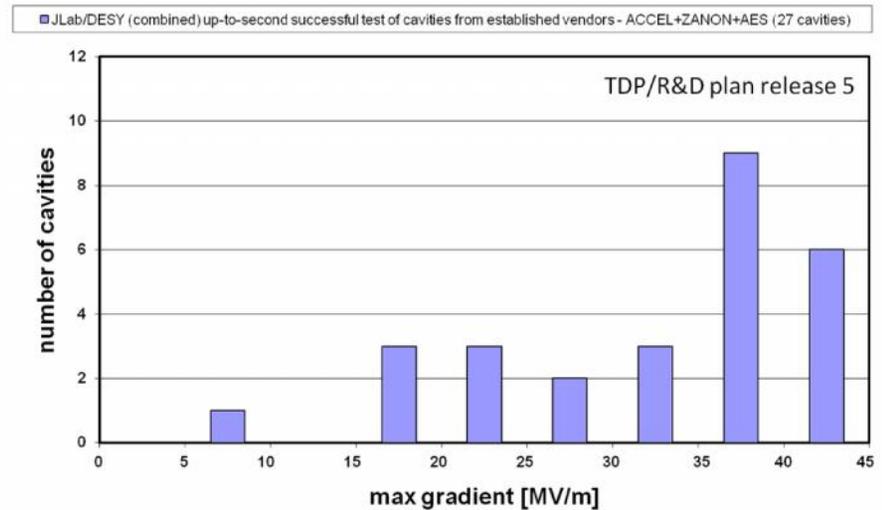


# More plots for the document

Electropolished 9-cell cavities

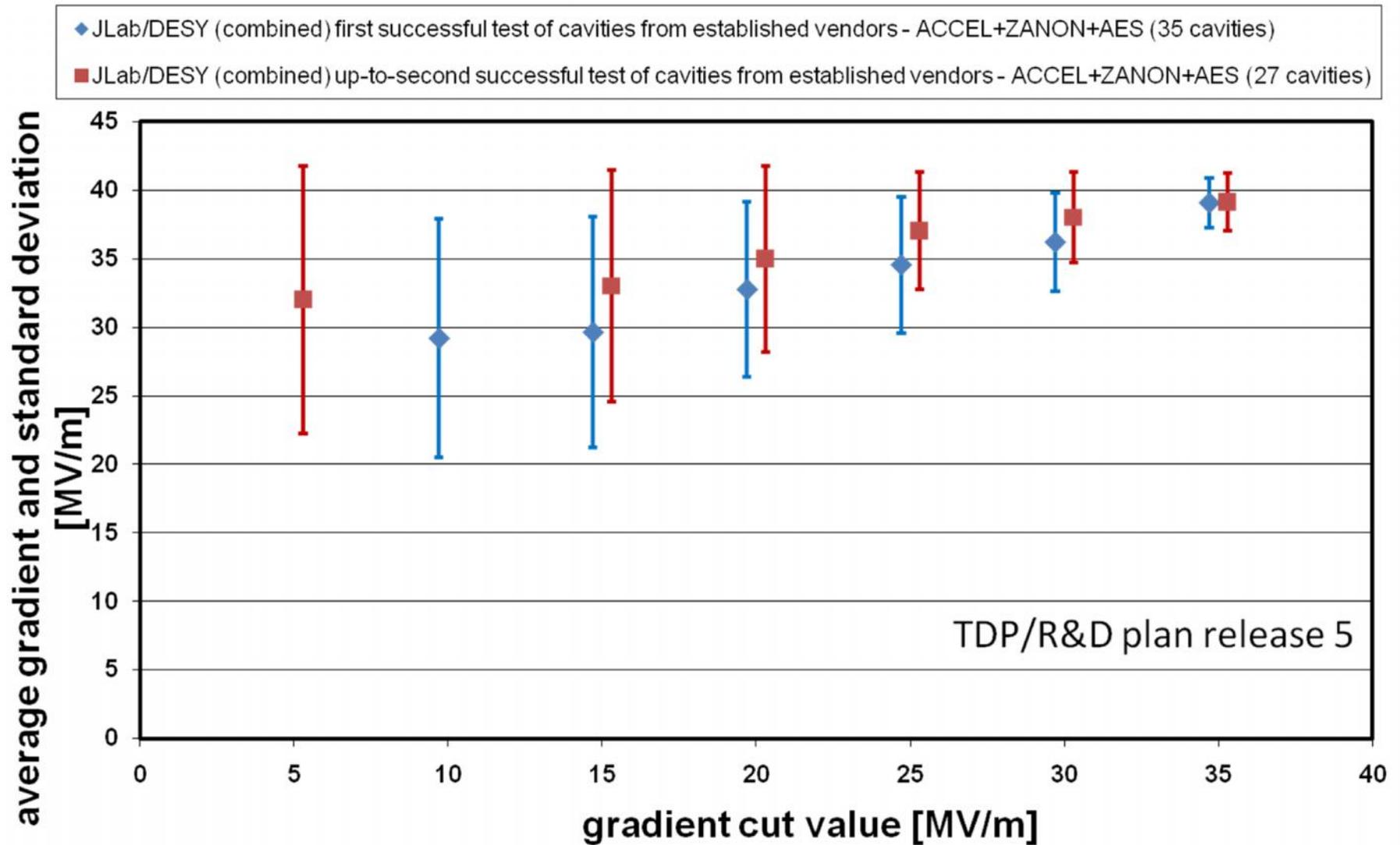


Electropolished 9-cell cavities



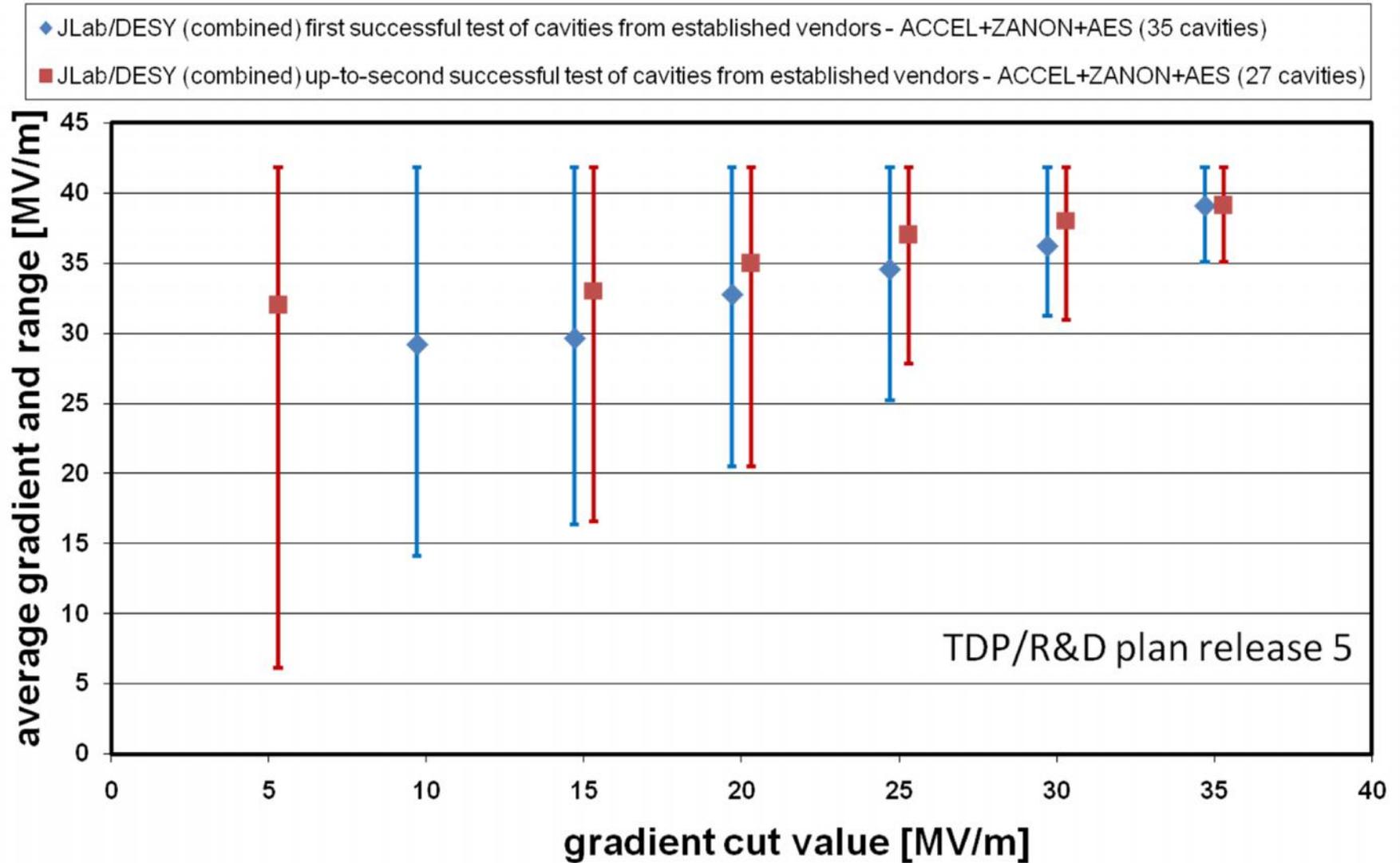
# More plots for the document

## Electropolished 9-cell cavities



# More plots for the document

## Electropolished 9-cell cavities



# Cavity yield history

		yield for			
		>25 MV/m		>35 MV/m	
		1st pass	2nd pass	1st pass	2nd pass
ALCPG-Albuquerque	01.Oct.2009	63+-10	67+-10	23+-9	33+-10
AAP-DESY	06.Jan.2010	63+-9	64+-10	27+-8	44+-10
LCWS2010-Beijing	28.Mar.2010	66+-8	70+-9	28+-8	48+-10
TDP/R&D plan release 5	30.Jun.2010	66+-8	74+-8	29+-8	56+-10

NB: errors are very strongly correlated

# Comments on the plots

- In LCWS2010 plots, two cavity tests were mistakenly included in the 2<sup>nd</sup> pass plots which shouldn't have been
  - Z106 and AC149 had no surface treatment in between 1<sup>st</sup> and falsely-labeled 2<sup>nd</sup> passes
  - automation is an excellent thing
- For TDP/R&D plan release 5, three additional new cavities are included: TB9RI018 and TB9RI019 from JLab (1<sup>st</sup> and 2<sup>nd</sup> pass plots, but see note below), and AC146 from DESY (1<sup>st</sup> pass only)
  - 35 cavities for 1<sup>st</sup> pass, 27 cavities for 2<sup>nd</sup> pass
- Within the database group we are discussing how best to include cavity TB9RI018
  - The standard EP process at JLab was known to have poor temperature stability, suspect water introduced in the acid mixture during mixing; Rongli specified “do not include”
    - Resulting cavity performance not as good as usual: only 33 MV/m with Q-slope.; after 2nd light EP, performance improved to 39 MV/m.
    - "Do not include" normally means system limitation implies could not determine cavity limitation from test, and test to be repeated w/o additional surface preparation
    - If process was non-standard, the cavity would not be included in any plots
      - Problem in standard process, not new process
      - From R&D perspective, interesting to have cause/effect of such a deviation from normal performance understood
    - From an earlier email exchange, I believe Rongli wants this cavity included in the plots
    - Opinion from the database group is mixed, and clearly Rongli's specific input is needed
  - Next steps
    - I changed the status in the database to “include” for the purposes of making the plots in this talk, then changed it back
    - The contributing institution specifies the “include” flag, therefore this requires Rongli's confirmation about the preferred specification of the cavity in the database