

# CLIC Injector Linacs Summary

A. Kurtulus, A. Grudiev, S. Doebert, A. Latina, Y. Zhao

CLIC MB injector design meeting: 10

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# CLIC Booster, $e^-$ and $e^+$ Injector Linac Structure Parameters

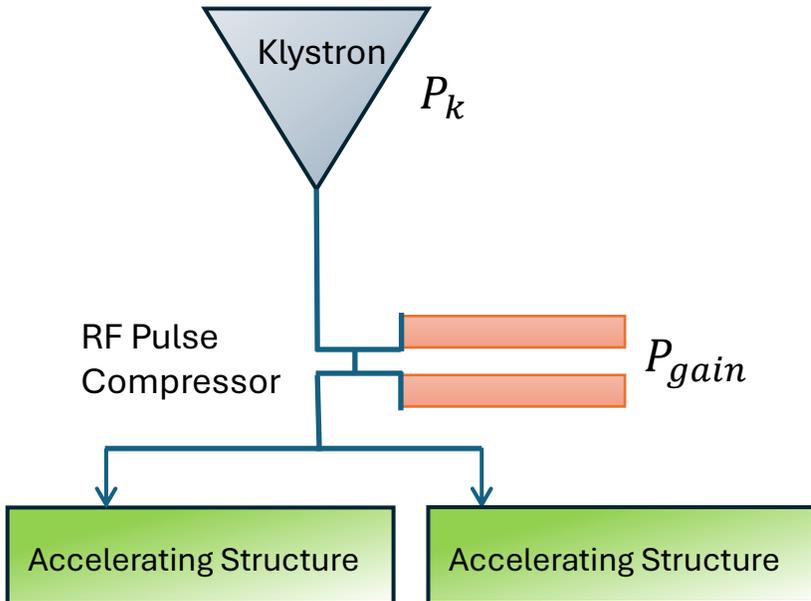
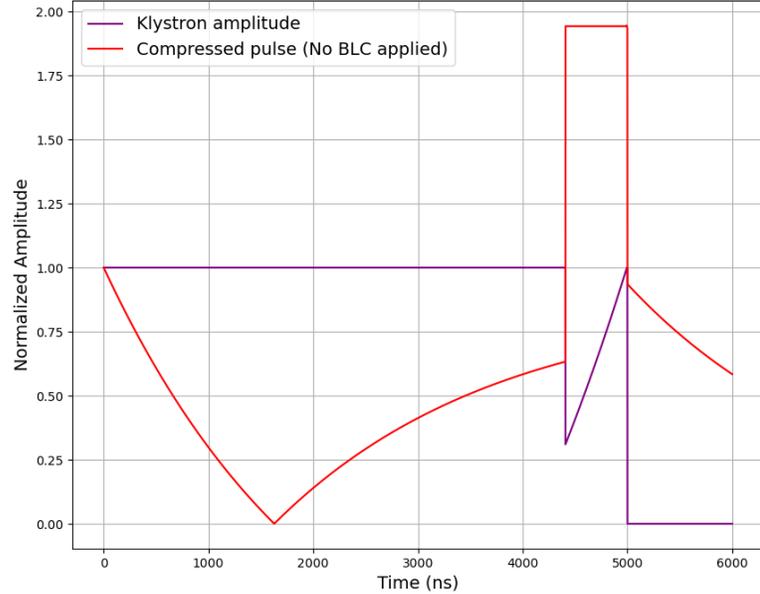
## Summary Table

$f = 2 \text{ GHz}$ , Length = 3m, Phase advance =  $2\pi/3$ ,  $Q_{0,\text{SLED}} = 2e5$ ,  $T_{\text{klystron}} = 5 \text{ us}$

	Booster and $e^-$ Injector Linac	$e^+$ Injector Linac
Avg. Aperture	18 mm	22 mm
Delta	3 mm	2 mm
Entr., exit aperture	21 mm $\rightarrow$ 5 mm	24 mm $\rightarrow$ 20 mm
Iris thickness	3.26 mm $\rightarrow$ 4.06 mm	8.46 mm $\rightarrow$ 8.46 mm
Vg (% c)	4.21 $\rightarrow$ 1.39	4.44 $\rightarrow$ 2.50
r/Q (kOhm/m)	2.58 $\rightarrow$ 3.22	2.21 $\rightarrow$ 2.57
Q	19799 $\rightarrow$ 19519	18619 $\rightarrow$ 18490
Filling time	416 ns	300 ns
SLED coupling	14	14
Integral of WT (V/pC/mm/m)	9.15	10.13
Klystron power per structure	31 MW	31 MW

No BLC applied input RF pulse

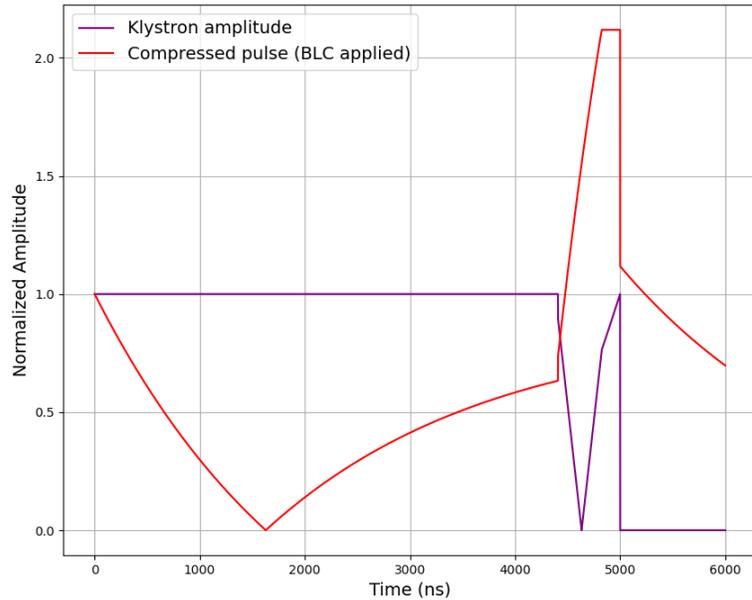
# CLIC Booster, $e^-$ and $e^+$ Injector Linac RF Module



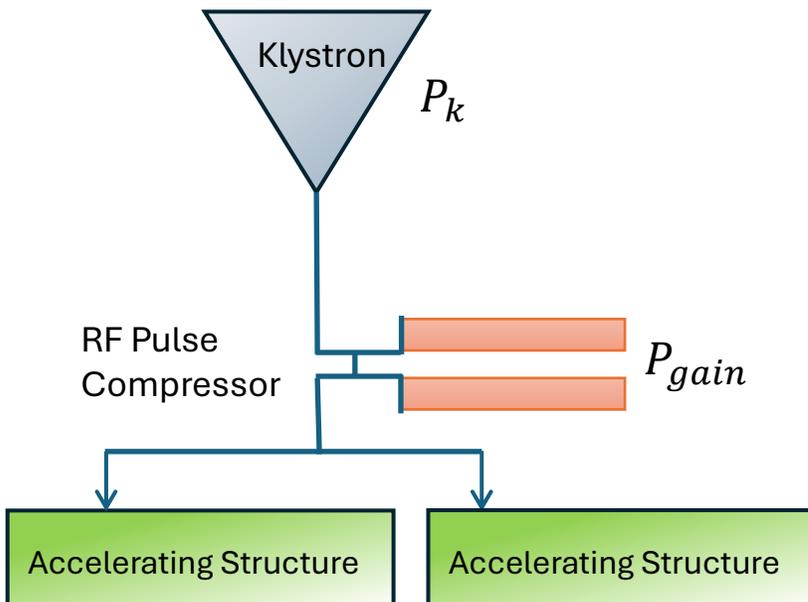
	Booster and $e^-$ Injector Linac		$e^+$ Injector Linac
Structure Avg. Aperture	18 mm		22 mm
Klystron power per structure	31 MW		31 MW
Linac type	Booster Linac	$e^-$ Injector Linac	$e^+$ Injector Linac
$\Delta E$	6.14 GeV	2.66 GeV	2.66 GeV
Nominal Bunch Charge	0.83 nC	1 nC	1 nC
SLED Power Gain	3.78	3.78	4.22
Loaded Voltage	50.20 MV	46.69 MV	43.42 MV
Loaded $G_{avg}$	16.73 MV/m	15.56 MV/m	14.47 MV/m
Number of structures	122	57	61
Number of klystrons	61	29	31

BLC applied input RF pulse

# CLIC Booster, $e^-$ and $e^+$ Injector Linac RF Module



- Beam-loading ramp applied.

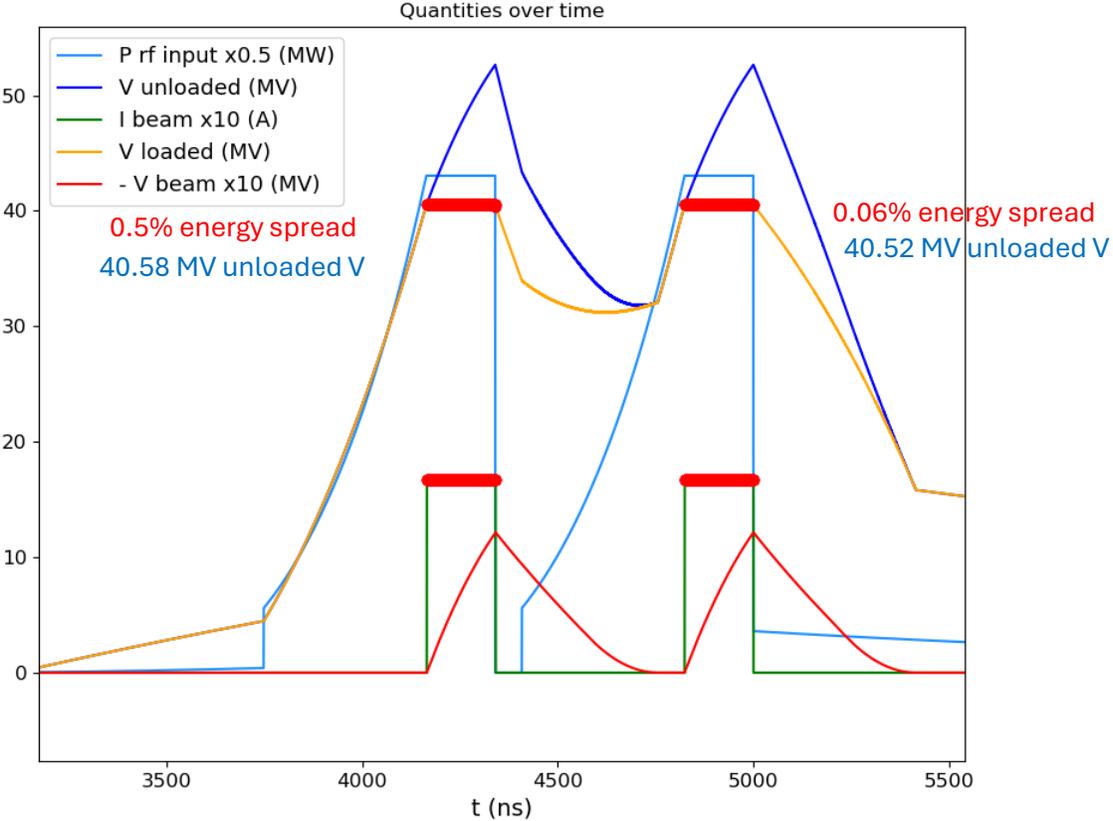
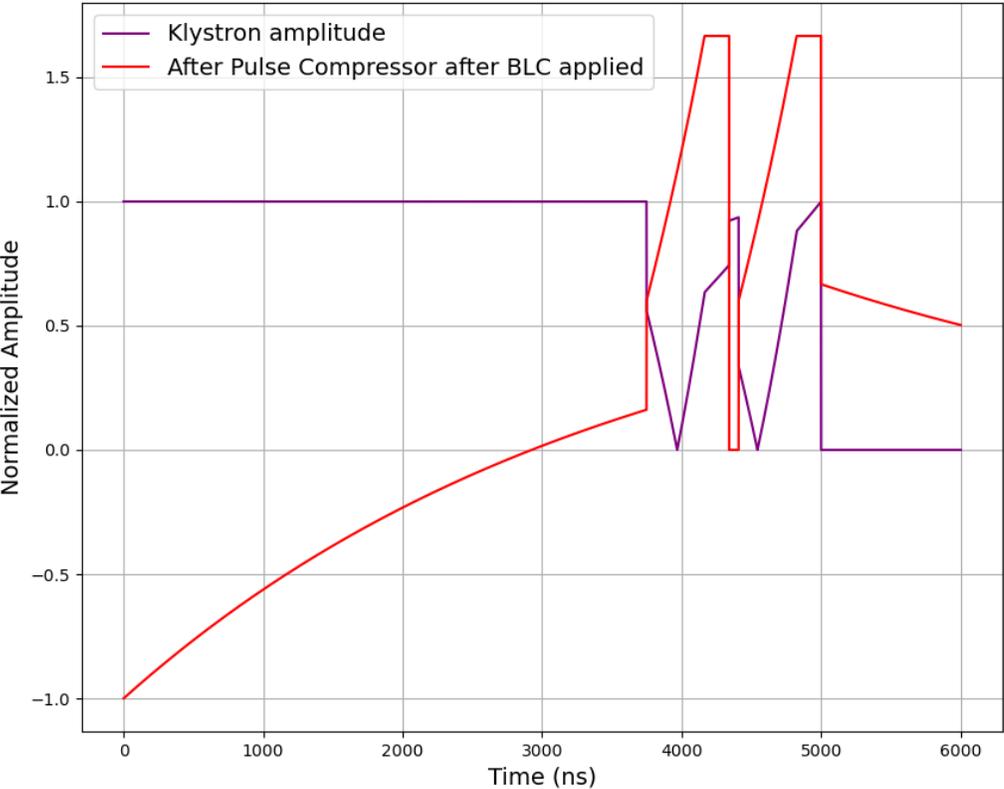
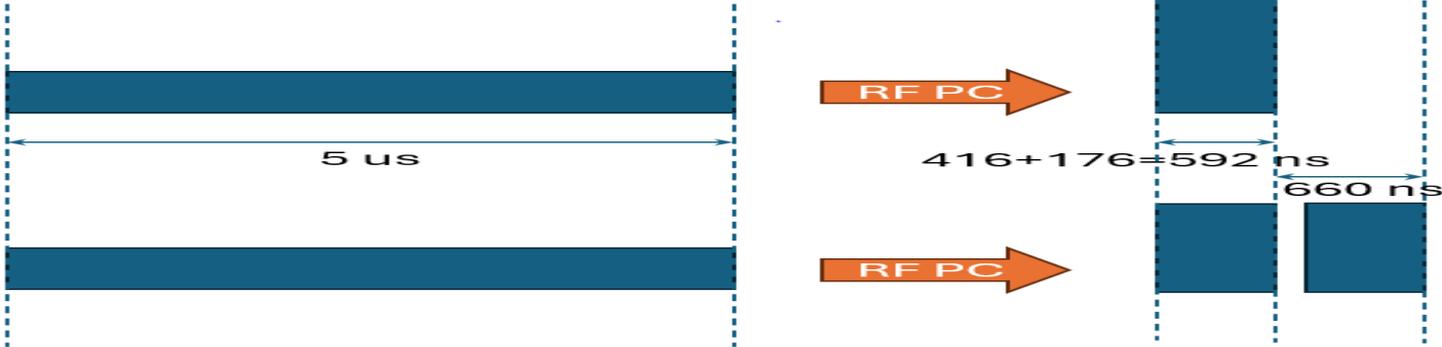


	Booster and $e^-$ Injector Linac		$e^+$ Injector Linac
Structure Avg. Aperture	18 mm		22 mm
Klystron power per structure	31 MW		31 MW
Linac type	Booster Linac	$e^-$ Injector Linac	$e^+$ Injector Linac
$\Delta E$	6.14 GeV	2.66 GeV	2.66 GeV
Nominal Bunch Charge	0.83 nC	1 nC	1 nC
SLED Power Gain	4.38	4.5	4.64
Loaded Voltage	55.4 MV	53 MV	46.24 MV
Loaded $G_{avg}$	18.47 MV/m	17.67 MV/m	15.41 MV/m
Number of structures	111	50	58
Number of klystrons	56	25	29

Double compressed-BLC applied  
input RF pulse

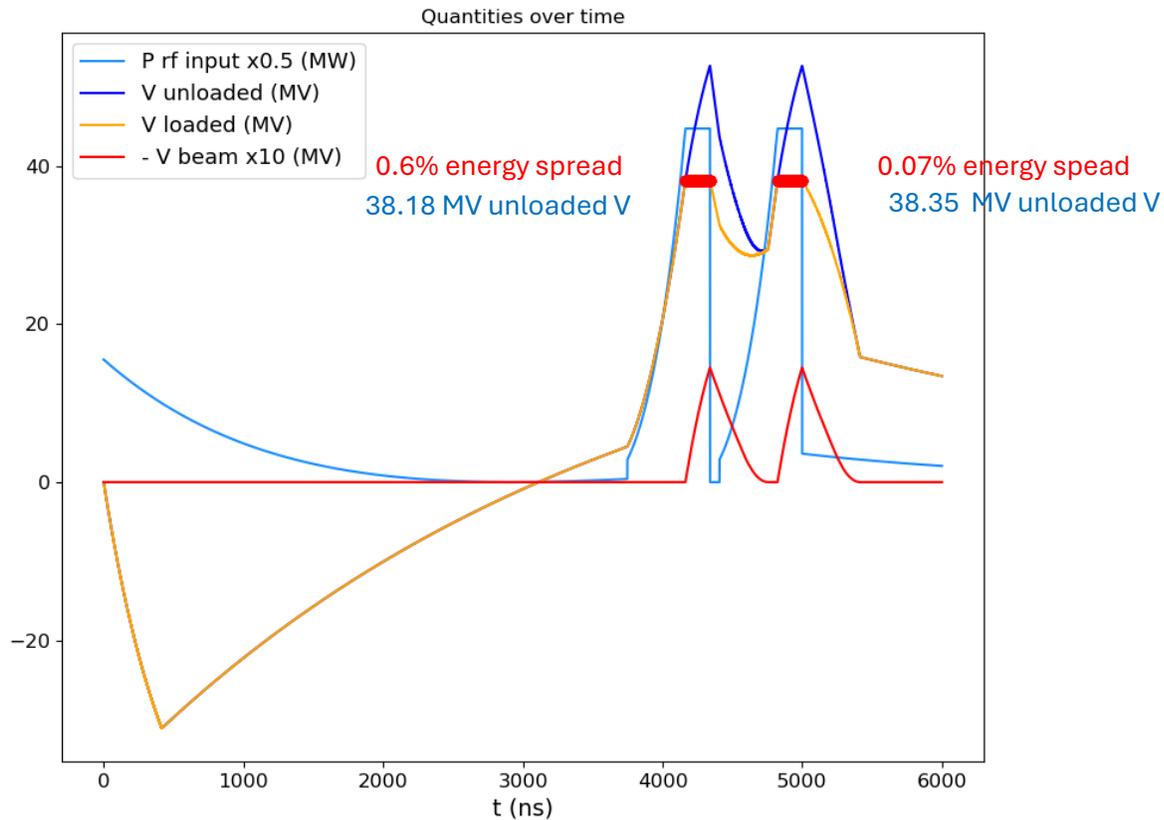
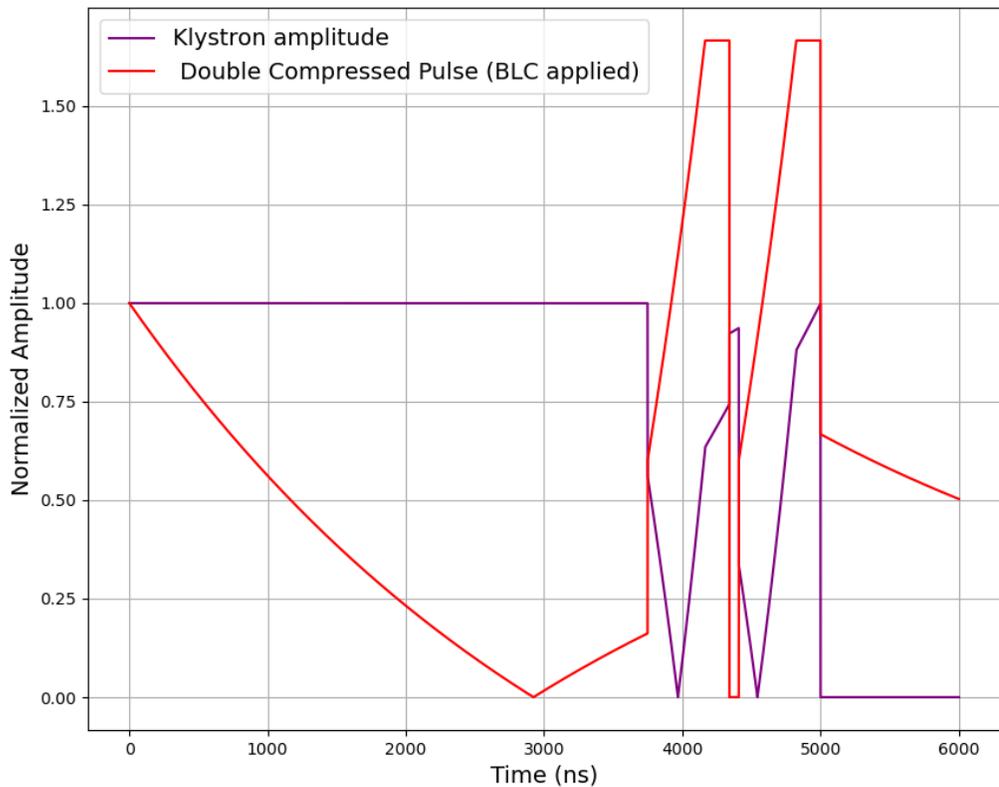
# CLIC *Booster* Linac

## Double compressed pulse:



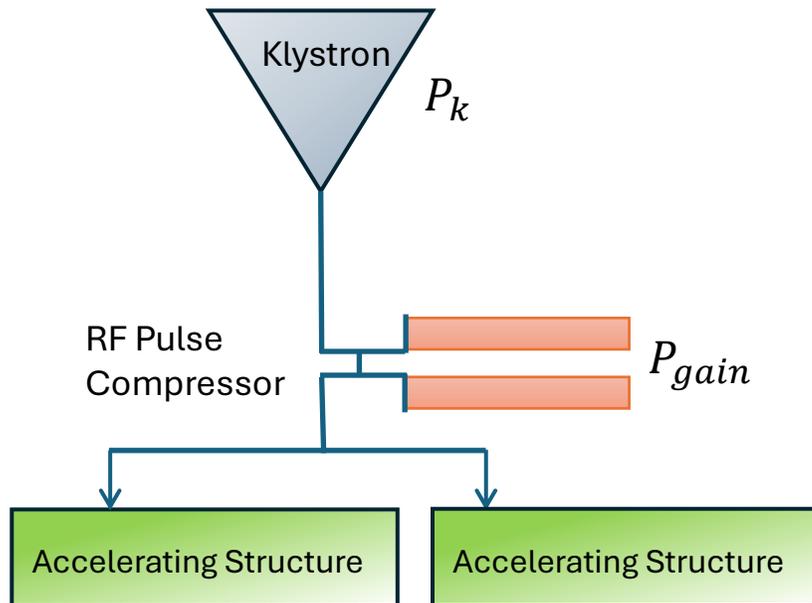
# CLIC $e^-$ Injector Linac

## Double compressed pulse:



# CLIC Booster, $e^-$ and $e^+$ Injector Linac RF Module

- Double Compressed pulse beam-loading ramp applied.



	Booster and $e^-$ Injector Linac	
Structure Avg. Aperture	18 mm	
Klystron power per structure	31 MW	
Linac type	Booster Linac	$e^-$ Injector Linac
$\Delta E$	6.14 GeV	2.66 GeV
Nominal Bunch Charge	0.83 nC	1 nC
SLED Power Gain	2.78	2.89
Loaded Voltage	40.55 MV	38.18 MV
Loaded $G_{avg}$	13.52 MV/m	12.73 MV/m
Number of structures	151	70
Number of klystrons	76	35

# CLIC Booster, $e^-$ and $e^+$ Injector Linac RF Module

## Summary Table

	Booster and $e^-$ Injector Linac						$e^+$ Injector Linac	
Structure Avg. Aperture	18 mm						22 mm	
Klystron power per structure	31 MW						31 MW	
Linac type	Booster Linac			$e^-$ Injector Linac			$e^+$ Injector Linac	
$\Delta E$	6.14 GeV			2.66 GeV			2.66 GeV	
Nominal Bunch Charge	0.83 nC			1 nC			1 nC	
Input RF pulse applied	No BLC	BLC applied	Double compressed pulse BLC applied	No BLC	BLC applied	Double compressed pulse BLC applied	No BLC	BLC applied
Loaded $G_{avg}$	16.73 MV/m	18.47 MV/m	13.52 MV/m	15.56 MV/m	17.67 MV/m	12.73 MV/m	14.47 MV/m	15.41 MV/m
Number of structures (Spare ones)	122+2 (4)	111+2 (4)	151+2 (4)	58+1 (2)	50+1 (2)	70+1 (2)	61+1 (2)	58+1 (2)
Number of klystrons (Spare ones)	62 (2)	57 (2)	77 (2)	29 (1)	26 (1)	36 (1)	31 (1)	30 (1)
		+10.4% in $G_{avg}$	-19.2% in $G_{avg}$		+13.6% in $G_{avg}$	-18.2% in $G_{avg}$		+6.5% in $G_{avg}$