Pulse compressor updates

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Pulse compressor calculation

Lineariser: L=0.6 m, vg=12.3%Co, filling time~16.3 ns
Gyroklystron: rising time (from 0 to 180) 5 ns
bandwidth~200 MHz Power=3.0 MW
Compression ratio (Cr)=$T_{klystron}$/$T_{lineariser}$
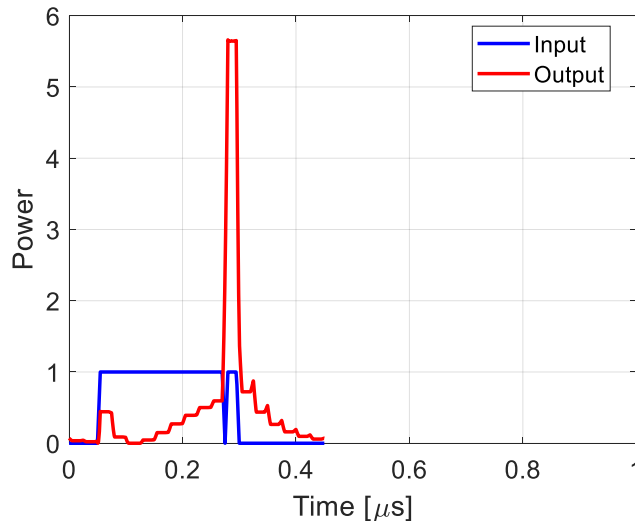
Dual-moded SLED2: two delay lines
SLED2 diameter=60 mm
SLED2 lengtn depends on the compressed length

Cr=10, Power gain=5.6➔16.8 MW
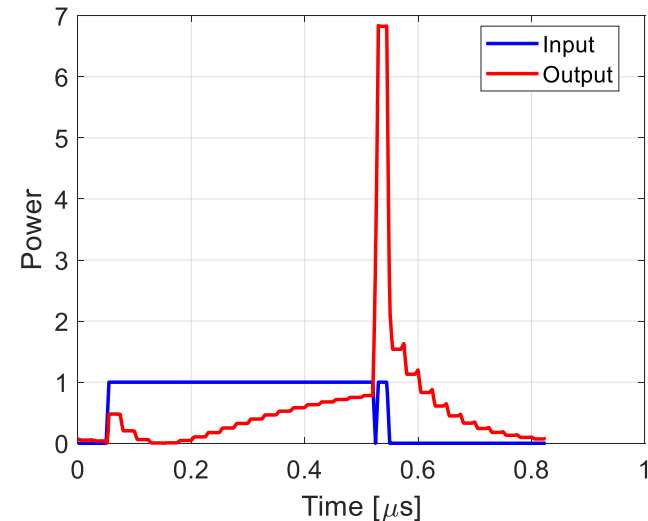
Cr=20, Power gain=6.8➔20.4 MW

I. Syratchev

Gradient vs Length for Linearisers

Dual-moded SLED2 diameter=60 mm, length=1.94 m (26.3 ns compressed width)
Compression ratio=25, Power gain=7.038
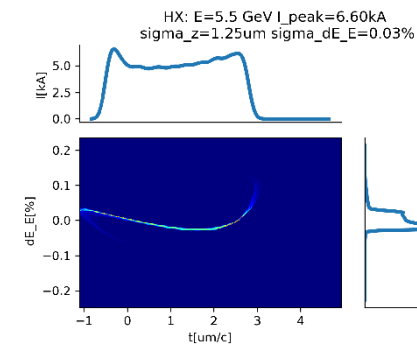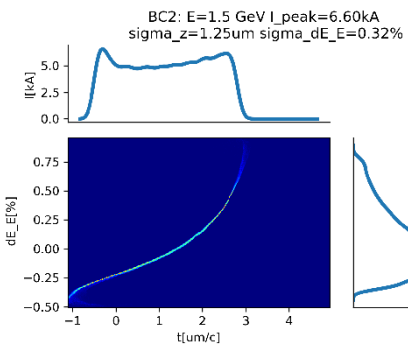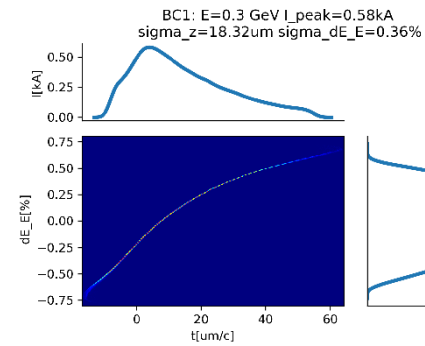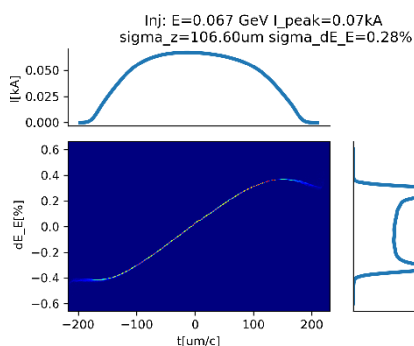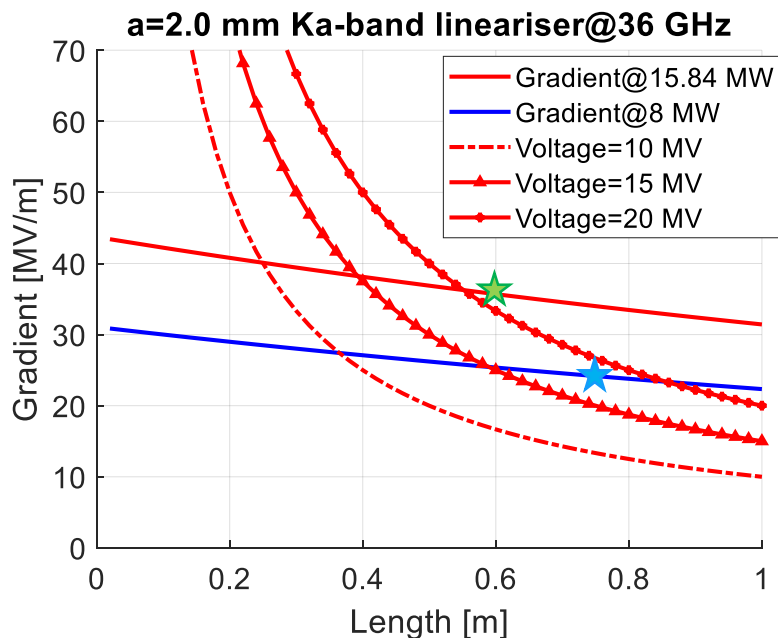Efficiency is low when compression ratio is high

Assuming 25% loss for the whole rf system
Output Power: 3 MW*7.038 + 25% additional loss→ 15.84 MW
Accumulated voltage: 21.41 MV

Acceptable beam dynamics results from 1D simulations
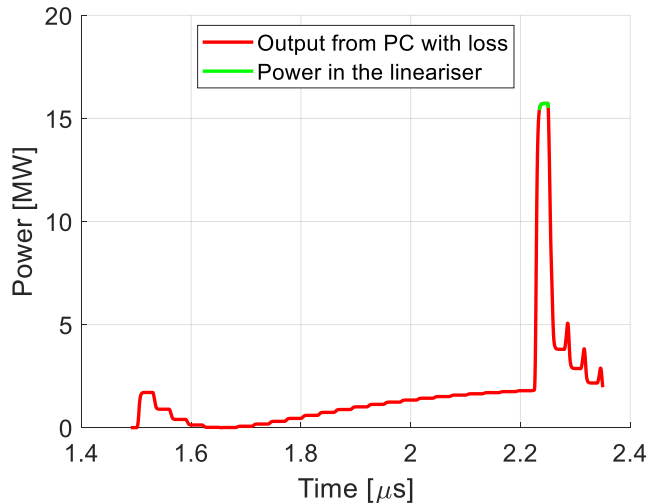Structure length 0.6 m

* Courtesy by X. Liu (WP6)

Influence from power source bandwidth

Jinchi is proposing to use a 36 GHz klystron as the power source which has smaller bandwidth but is more compact

Source power [MW]	Input width [ns]	Bandwidth [MHz]	Compression ratio	Lineariser voltage [MV]
3	750	200	25	21.32
3	750	100	25	21.11
3	750	50	25	20.27
3	750	40	25	19.77
3	1250	50	25	21.11
2.4	750	50	25	18.13

200 MHz bandwidth

50 MHz bandwidth