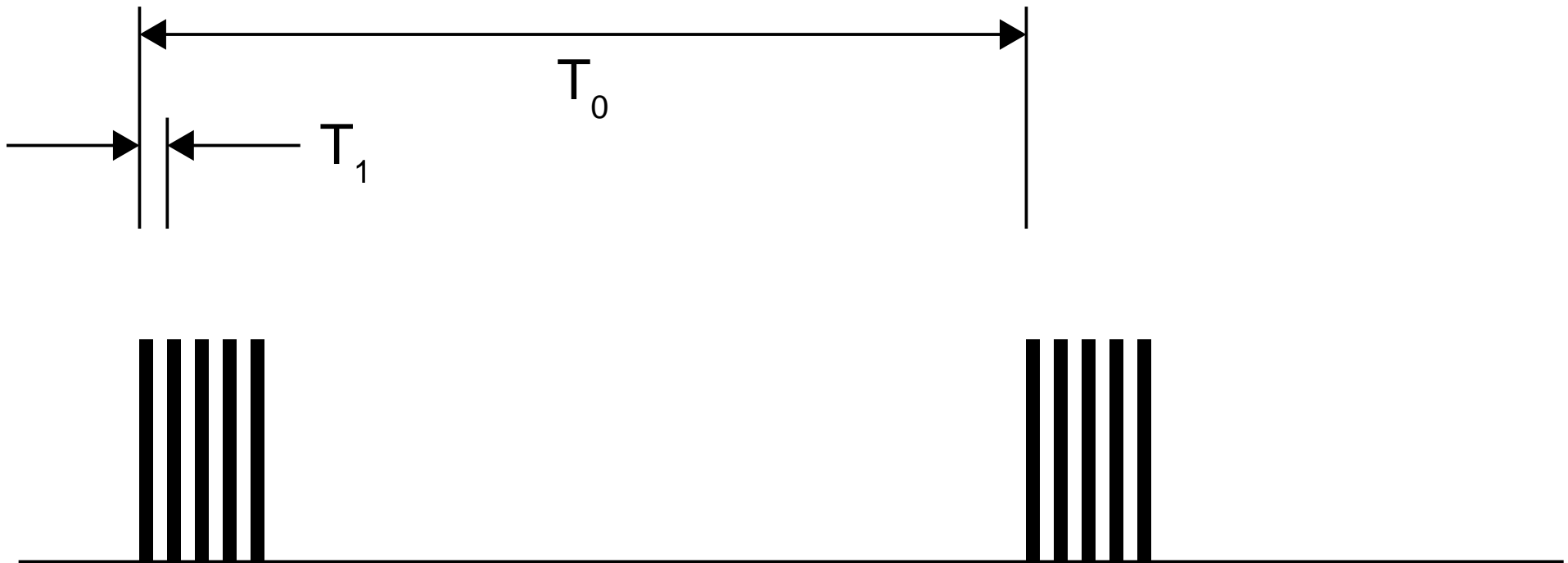


# **Downstream Systems and The Proton Driver**

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# Bunch Train Timing



# Overall Repetition Rate ( $T_0$ )

- Like lower: average power requirements reduced
- Like higher: beam loading reduced in RLA/FFAG cavities

# Number and Timing of Sub-Bunches

- More sub-bunches reduce beam loading without increasing average power requirements significantly
- However, must increase peak power to top off RF between bunches
- For 4 MW, 50 Hz, 10–20 GeV FFAG, 1 MW into input coupler, 17 MV/m

Bunch trains	Time for full train
2	112 $\mu$ s
3	149 $\mu$ s
4	168 $\mu$ s
5	179 $\mu$ s