

# Klystron Report

In the one dimensional Klystron ballistic formulation, we derived the arrival time versus exit time,  $\omega t_2 - \theta_0$  versus  $\omega t_1$ .

1. From the derived relation build a computer program that calculate and plot the normalized current  $i(t_2)/I_0$  versus  $\omega t_2 - \theta_0$  for the following bunching parameter values:
  - (a)  $X = 0.5$  under bunched case.
  - (b)  $X = 1$  critically bunched case.
  - (c)  $X = 1.5$  over bunched case.
2. From part (1) calculate the Fourier series expansions, i.e. Fast Fourier Transform FFT, to find the fundamental and the harmonic contents of the current for each value of  $X$  in part (1).
3. Compare the harmonic amplitudes to that calculated analytically.