ACS662
Data Processing and Analysis

2021 Fall Semester

Week 7

Chong Shik Park, Ph.D.

Department of Accelerator Science/

Accelerator Research Center

Korea University, Sejong Campus

Midterm Project

- Using Sirepo/Synergia

- Generate bunch distribution and plot (horizontal, vertical, and cross-section) phase spaces with projections (10 pts)
  - For the beam distribution use $\varepsilon_x = 5$, and $\varepsilon_y = 5$.

- Compute turn-by-turn(tbt) particle data for 200 turns (5 pts)
  - Space Charge (2d open Hockney)
  - Steps per element = 1
  - Beam Diagnostics per Turn Period = 1
  - Stepper Map Order = 1
  - Default Extractor Type = chef_map

- Plot Twiss parameters $\alpha_x, \beta_x, D_x, \alpha_y, \beta_y, D_y$ for 5 turns (15 pts)

- Save tbt particle data for all turns and create an animation of phase space evolutions for horizontal, vertical and cross-section planes (20 pts)

- (Optional) Create phases space animations using ParaView (10 pts)