

PHY 6991, Section 002

Measurements of Correlation Functions

Syllabus

Instructor:

C. Pruneau, 7-1813 (cell: 248 686 6354)

Office Hours:

Walk-in or any day/time by appointment

Class Meetings:

Mondays & Wednesdays, 10:40 AM to 11:35 AM,
Rm 177 Physics Bldg.

Topics covered:

- (1) Definition of probability density functions (PDFs), joint-probability, conditional probability, and marginal probability (A refresher from Winter class)
- (2) Definition of statistics and examples: mean, variance, covariance. (Also a refresher from Winter class)
- (3) Introduction of the notion of correlation function based on the notion of covariance
- (4) Definition of correlation function
- (5) Properties of correlation functions (mostly in the context of heavy-ion collisions)
- (6) Examples of differential correlation: 2- and 3-particle correlation functions
- (7) Examples of integral correlation functions
- (8) Flow observables
- (9) HBT observables (if time permits)
- (10) Instrumental Effects on Correlation Functions and How to correct them
- (11) Simulation of Correlation functions

Evaluation

- (1) Exercises (home work) weekly: 60%
- (2) Short Project: 40%

Exercises will involve demonstrations, solution of specific problems, write-up of short C++ codes, or discussions.

Short Project: I will produce a ROOT file with an n-tuple containing simulated events. Your task will be to extract specific correlation functions of the particles simulated.