



Max-Planck-Institut für Physik
(Werner-Heisenberg-Institut)

**13th Block Course
of the
International Max Planck Research School
(IMPRS) on Elementary Particle Physics**

October 19th – 21st, 2009

Max-Planck-Institut für Physik, Freimann

10:00 AM – 11:55 AM, Main Auditorium (Lectures)

2:00 PM – 4:00 PM, Room 313 (Exercises)

Prof. Dr. Allen Caldwell, Dr. Daniel Kollar, Dr. Kevin Kroeninger

(Max-Planck-Institut für Physik, CERN, Universität Göttingen)

Probability, Statistics and Data Analysis

Lecture 1 Introduction to probability and statistics, to the basic distributions and when they are applicable

Exercise 1 Introduction to the Bayesian Analysis Toolkit (BAT), downloading BAT and getting it to run on your computer, simple examples

Lecture 2 Formulation of data analysis. Introduction of chi squared, maximum likelihood and the Bayes-Laplace formula. Calculating probability intervals. Detailed examples

Exercise 2 Participants will analyze a real data set and extract information on interesting parameters (e.g., limit on the existence of right-handed W bosons)

Lecture 3 Hypothesis testing and goodness-of-fit. Comparison of Bayesian and frequentist approaches. Discussion of open issues

Exercise 3 Data analysis of event counting experiment. Hypothesis testing and goodness-of-fit tests on realistic examples

Please register by sending an e-mail to Monika Goldammer <imprs-office@mppmu.mpg.de> before October 8th, 2009. For the exercises, you will have to bring a notebook/computer.

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