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Lecture/Tutorial: Foundations of Limit Setting I

Wednesday 5 October 2011 09:00 (1h 30m)

The series of lectures will cover the statistical methods used in searches for new phenomena in a particle physics experiment. Statistical tests will be formally defined and used to quantify the level of agreement between a specified model and the observed data. Specifically, one tries to reject the Standard Model in such a test, as this will indicate the discovery of something new. Even in the absence of a discovery, we would like to say what possible signal models one may exclude by setting limits on their parameters. Several procedures for doing this will be discussed, including CLs, Power-Constrained Limits (PCL), Bayesian, and Feldman-Cousins methods. The lectures will focus on frequentist methods, but the Bayesian approach will be addressed as well. In both cases the role of systematic uncertainties will be emphasized. Computer tutorials will provide a practical exposure to the procedures covered in the lectures.

Presenter: COWAN, Glen (University of London)