



Contribution ID: 64

Type: **not specified**

Statistical Models with Uncertain Error Parameters

In a statistical analysis in Particle Physics, nuisance parameters can be introduced to take into account various types of systematic uncertainties. The best estimate of such a parameter is often modeled as a Gaussian distributed variable with a given standard deviation (the corresponding “systematic error”). Although the assigned systematic errors are usually treated as constants, in general they are themselves uncertain. A type of model is presented where the uncertainty in the assigned systematic errors is taken into account. Estimates of the systematic variances are modeled as gamma distributed random variables. The resulting confidence intervals show interesting and useful properties. For example, when averaging measurements to estimate their mean, the size of the confidence interval increases for decreasing goodness-of-fit, and averages have reduced sensitivity to outliers. The basic properties of the model are presented and several examples relevant for Particle Physics are explored.

Primary author: COWAN, Glen (Royal Holloway, University of London)

Presenter: COWAN, Glen (Royal Holloway, University of London)

Session Classification: Contributed talks session