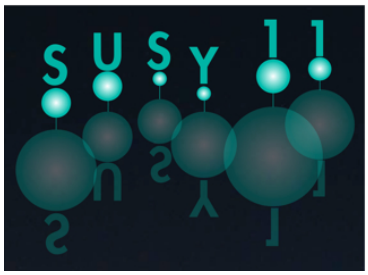

Contribution ID: **97** Type: **not specified**

Z' Bosons at Colliders: a Bayesian Viewpoint

Monday, August 29, 2011 12:35 PM (20 minutes)

We revisit the CDF data on di-muon production to impose constraints on a large class of Z' bosons occurring in a variety of E_6 GUT based models. For this we suggest an alternative statistical analysis method which ultimately allows to straightforwardly (i)~vary the gauge coupling strength, g', of the underlying $U(1)'$; (ii)~include interference effects with the Z' amplitude (which are especially important for large g'); (iii)~smoothly vary the $U(1)'$ charges; (iv)~combine
these data with the electroweak precision constraints, as well as with other observables obtained from colliders
such as LEP~2 and the LHC; and (v)~find preferred regions in parameter space once an excess is seen.
Our method yields limits generally differing by only a few percent from the CDF ones when we follow their approach.
We also analyze the dependence of these limits on various factors contributing to the production cross-section, showing that currently systematic and theoretical uncertainties play a relatively minor rôle.
One general result is that interference effects are quite relevant if one aims at discriminating between models.
We use a Bayesian method to project lower limits on the Z' mass for the Tevatron and for a number
of actual and hypothetical reference energies and luminosities for the LHC. Finally, we show the full classification of the E_6 Z'
models with integer charges.

Primary authors: Dr ROJAS, Eduardo (Instituto de Física Universidad Nacional Autónoma de México); Dr ERLER, Jens (Instituto de Fisica Universidad Nacional Autónoma de México)

Co-authors: LANGACKER, Paul (School of Natural Sciences, Institute for Advanced Study, \\ Einstein Drive, Princeton, NJ 08540, USA); MUNIR, Shoaib (Department of Physics, COMSATS Institute of Information Technology, \\ Defence Road, Lahore-54000, Pakistan)

Presenter: Dr ROJAS, Eduardo (Instituto de Física Universidad Nacional Autónoma de México)

Session Classification: Parallel Session 3

Track Classification: Unified models