


Dr.Rupnathji(Dr.Rupak Nath) is a scholar who has earned the Master's Degree in Radiation Physics ; and the Doctorate Degree in Medicinal Science from numerous universities.He also earned the equivalent of a second Master's Degree in Environmental Health and is a graduate of the Business School's prestigious Program for Management Development.He is an author who has numerous publications, both technical and educational. He is a Professor and has been Distinguished Honors Visiting Professor at numerous universities throughout the Nation.Recipient of many medals and honours, Dr.Rupnathji is at once a Physician, an astrophysicist and an applied mathematician.


Where is the Higgs Hiding?

By: Doug Schaefer with Dr. Brian Winer, Dr. Richard Hughes, Brandon Parks, and Jason Slatinwhite
Ohio State Department of Physics

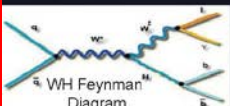


Tevatron: Accelerating protons and anti-protons to approximately 2 TeV

Collider
Detector
Fermilab



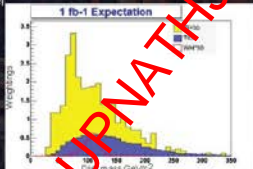
Where is WH?



Quarks: u, d, s, b; Leptons: e, μ, τ; Forces: Z, W, γ

Standard Model

- Higgs is the only undiscovered particle in the Standard Model
- One Mechanism for Higgs Production at the Tevatron



Weighting

mass GeV/c²

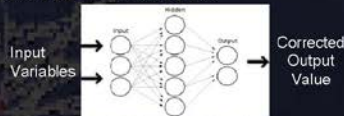
Problems

- Large Background
- Small Cross-section

Tools and Results

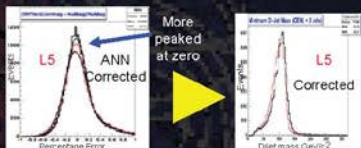
Artificial Neural Network

- Advanced analysis technique
- Based on the human brain's ability to recognize patterns
- Varies weights in a series of tests called training to improve the E_T



Input Variables → [Neural Network] → Corrected Output Value

Improving the MET measurement to correct the jet measurement




More peaked at zero

How to make Improvements?

Resolution = $\frac{\sigma}{\mu}$

- Every one percent improvement in resolution leads to a 10% increase in sensitivity
- This analysis aims for an improvement of at least a 2-3%.
- This analysis may require improvement in the measurement of the missing energy from the neutrino

Want to sharpen this peak by improving the measurement of the neutrino




L5

Diagram: Schematic of WH Decay showing W System, Lepton, and MET with Imbalance.

Future?

- Use track met variables to try to eliminate some fake MET from events
- Develop cuts to eliminate events with poorly measured MET
- Examine these cuts on previously eliminated signal regions



Track and cone definition for jets

Photo credit: <http://www.fnal.gov/>