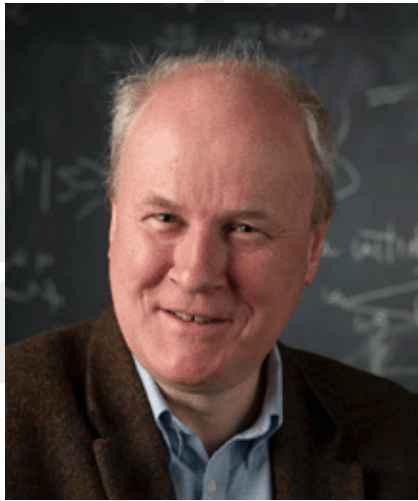


HIGH ENERGY PHYSICS

THE UNIVERSITY OF CHICAGO
ENRICO FERMI INSTITUTE

The Monday HEP Seminar PRESENTS:

“Bounding the Higgs width at the LHC”



R. Keith Ellis, Fermilab

I describe the hadronic production of the four-lepton final state, $e^-e^+\mu^-\mu^+$, through the fusion of initial state gluons. This reaction proceeds both via an intermediate Higgs boson (signal) and via a loop of fermions (continuum). I describe first full analytic results for helicity amplitudes that account for both the effects of the quark mass in the loop and off-shell vector bosons.

I use these results to study the interference between Higgs-mediated and continuum production of four-lepton final states, which is necessary in order to obtain accurate theoretical predictions outside the Higgs resonance region. The ratio of the off-resonance to on-resonance cross sections can be used to bound the total width of the Higgs boson. Using these results the CMS collaboration has reported an improvement on the bound on the total width of the Higgs boson by two orders of magnitude.

Monday, April 21, 2014

4:15PM in LASR 162

If any assistance is needed, call Aspasia Sotir-Plutis in advance at (773) 702-8113