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Deconvolving the detector from an observed signal in Fourier space.

Thursday 21 January 2016 14:00 (25 minutes)

In this talk we discuss algorithms for the analysis of hadronic final states,
with application to 1) Single top t-channel production; and 2) Heavy Higgs decaying as H->WW, in the lepton plus jets mode. In either case, nature has arranged for the
triple decay rates in kinematic angles of the decay, θ,θ^*, and ϕ^*
to be a short finite series in orthogonal functions, $a_{klm}Y_k^m(\theta, phi^*)Y_l^m(\theta^*, \phi^*)$ (summation implied). This observation
can be exploited in two ways; first, a technique called orthogonal series density
estimation may be employed to extract coefficients of the decay and physics parameters
related to these coefficients; second, an angular analog of the convolution theorem
may be employed to analytically deconolve detector resolution effects from an observed
signal. The technique leads typically to likelihood contours in a multidimensional
parameter space, and a simutaneous determination of physics parameters. This talk discusses analysis techniques in an experiment-independent way.

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