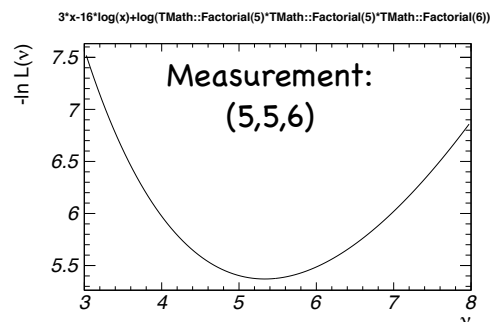


Statistical Methods of Data Analysis

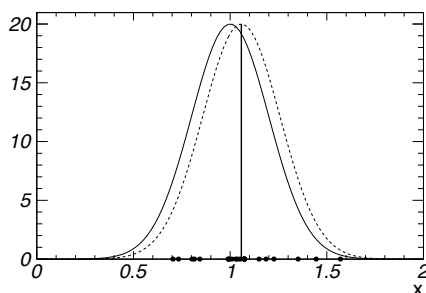
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Winter Semester 2010/2011

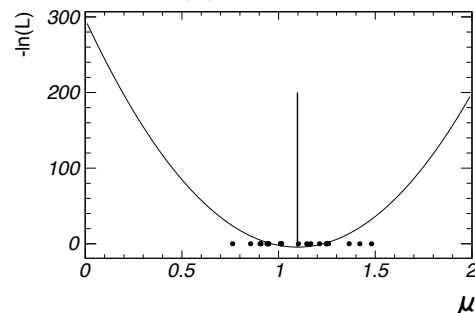
ML Method



True and Estimated Gaussian Function



$-\ln(L)$ for Gaussian

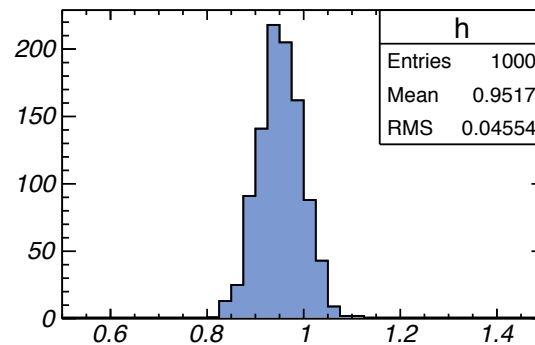


Variance of ML Estimator



- True values: Gaussian with $\mu = 1.0$, $\sigma = 0.2$
- Starting value for bootstrap: $\hat{\mu} = 0.952184$
- $m = 1000$ MC experiments, $n = 20$ data points each
- Analytic variance of μ : $\sigma^2/n = 0.002$
- Bootstrap result: $0.04554^2 \approx 0.0021$

Parametric Bootstrap



Report result as:
 $\hat{\mu} = 0.952 \pm 0.046$
 (cut off insignificant digits!)

ML Error Estimate



$-\ln(L)$ for Gaussian

