

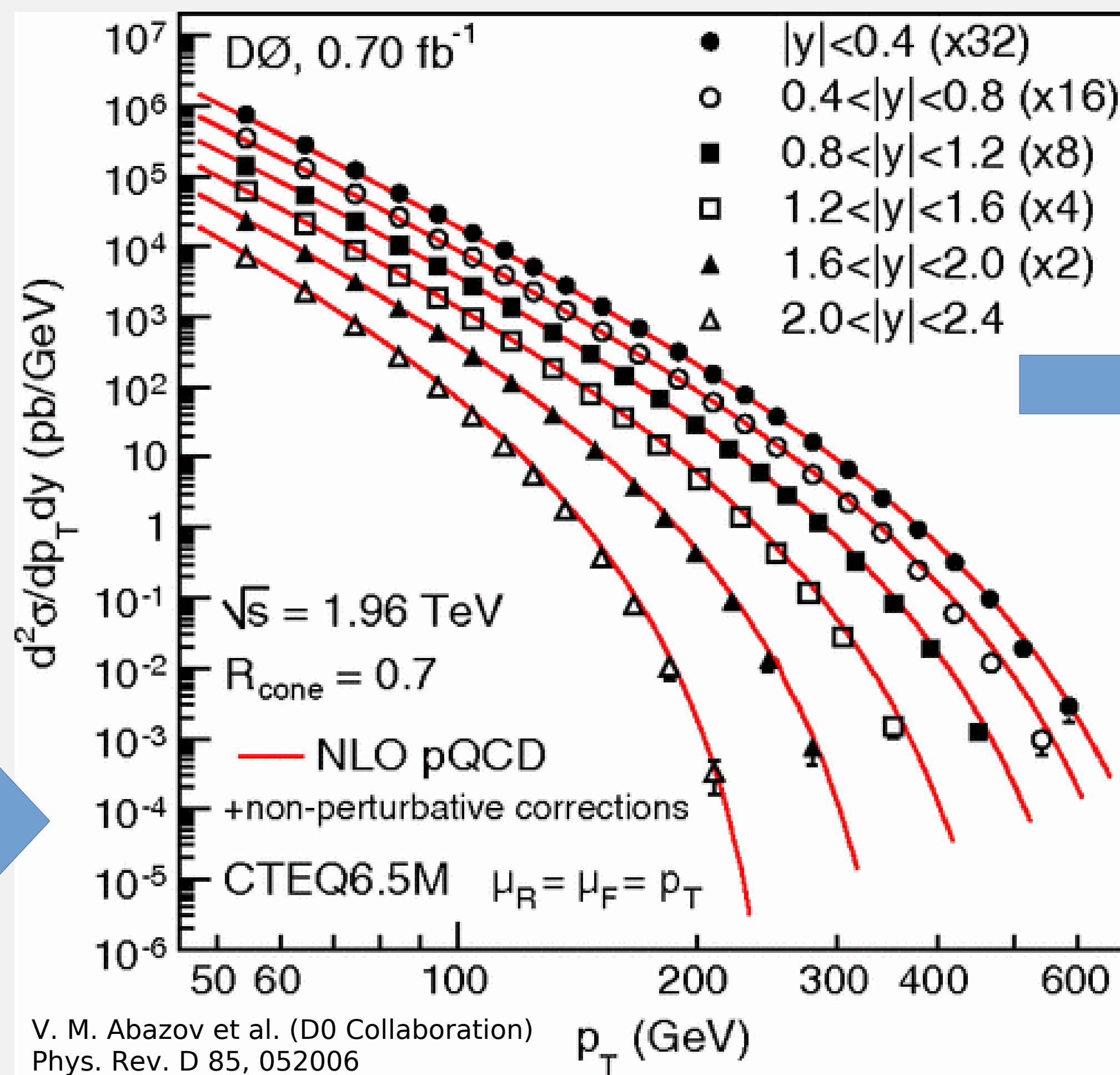
STEP

SMOOTHNESS TESTS WITH EXPANSION OF POLYNOMIALS

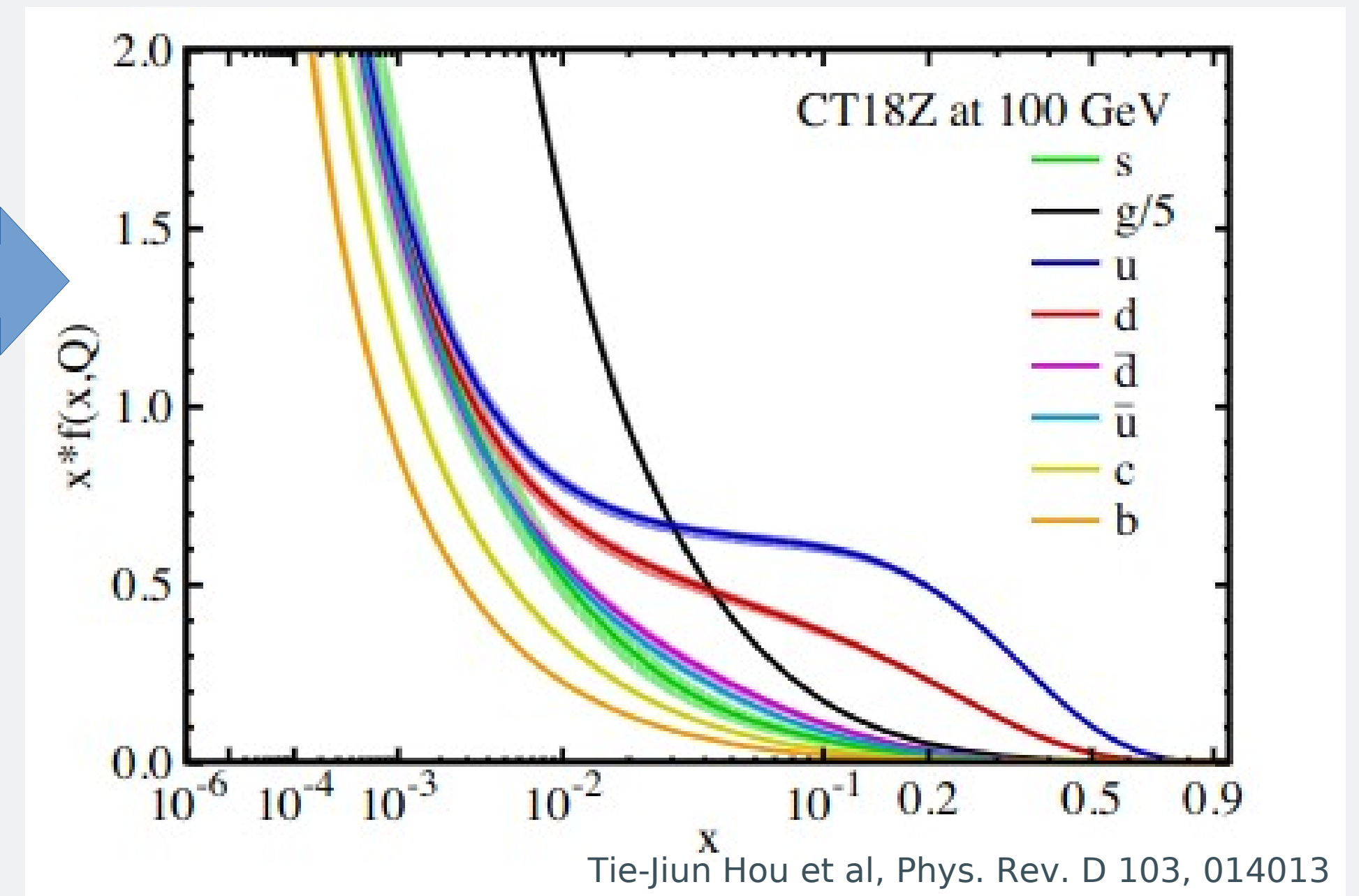
Patrick L.S. CONNOR (IEXP & CDSCS, Universität Hamburg), Radek ŽLEBČÍK (Charles-University)

Motivation

Provide highest precision measurements to understand the structure of matter
→ focus on pQCD

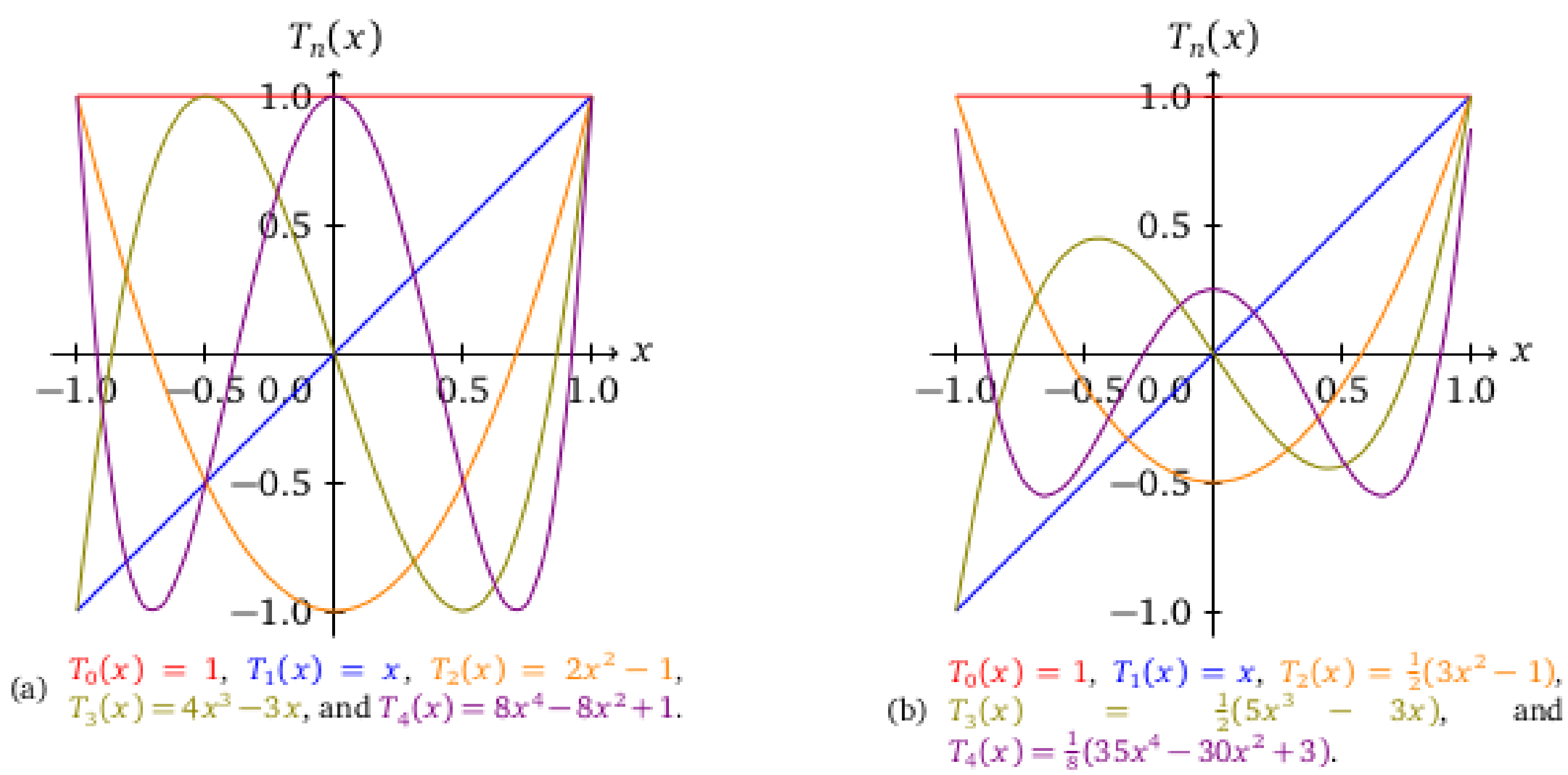


Extract PDFs and α_s from jet measurements



But logarithmic scale can hide monsters!

Tool



Idea: factor out the global behaviour and isolate outliers

$$f_n(p_T) = \exp\left(\sum_{i=0}^n b_i T_i\left(2 \frac{\log p_T / \log p_T^{\min}}{\log p_T^{\max} / \log p_T^{\min}} - 1\right)\right)$$

$$\chi_n^2 = \min_{b_{i \leq n}} [(x - y_{b_{i \leq n}})^T V^{-1} (x - y_{b_{i \leq n}})]$$

Find a polynomial of lowest order that describes the distribution



Figure 1: First orders of Chebyshev polynomials of first kind (left) and Legendre polynomials (right).

Application

