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Inclusive jets and dijets in LHCb

The paper is available here (LHCb-CONF-2011-015) [↗](#).

LHCb-CONF-2011-015

Abstract

The region $x > 3$ is a kinematic range of interest for Higgs searches, QCD physics and beyond the Standard Model studies in pp interactions at TeV energies. We explore the feasibility of measuring jets in the LHCb experiment, mainly devoted to precision measurements in the b-physics domain, but covering the very forward region $2 < \eta < 4.5$. The jets reconstruction capabilities of LHCb are presented, together with some preliminary results on inclusive jets and dijets that show the potential interest of LHCb results for low-x/high- Q^2 perturbative QCD tests. The data have been taken at LHC during the 2010 runs at $\sqrt{s} = 7$ TeV.

Figures

(eps versions are available under attachments).

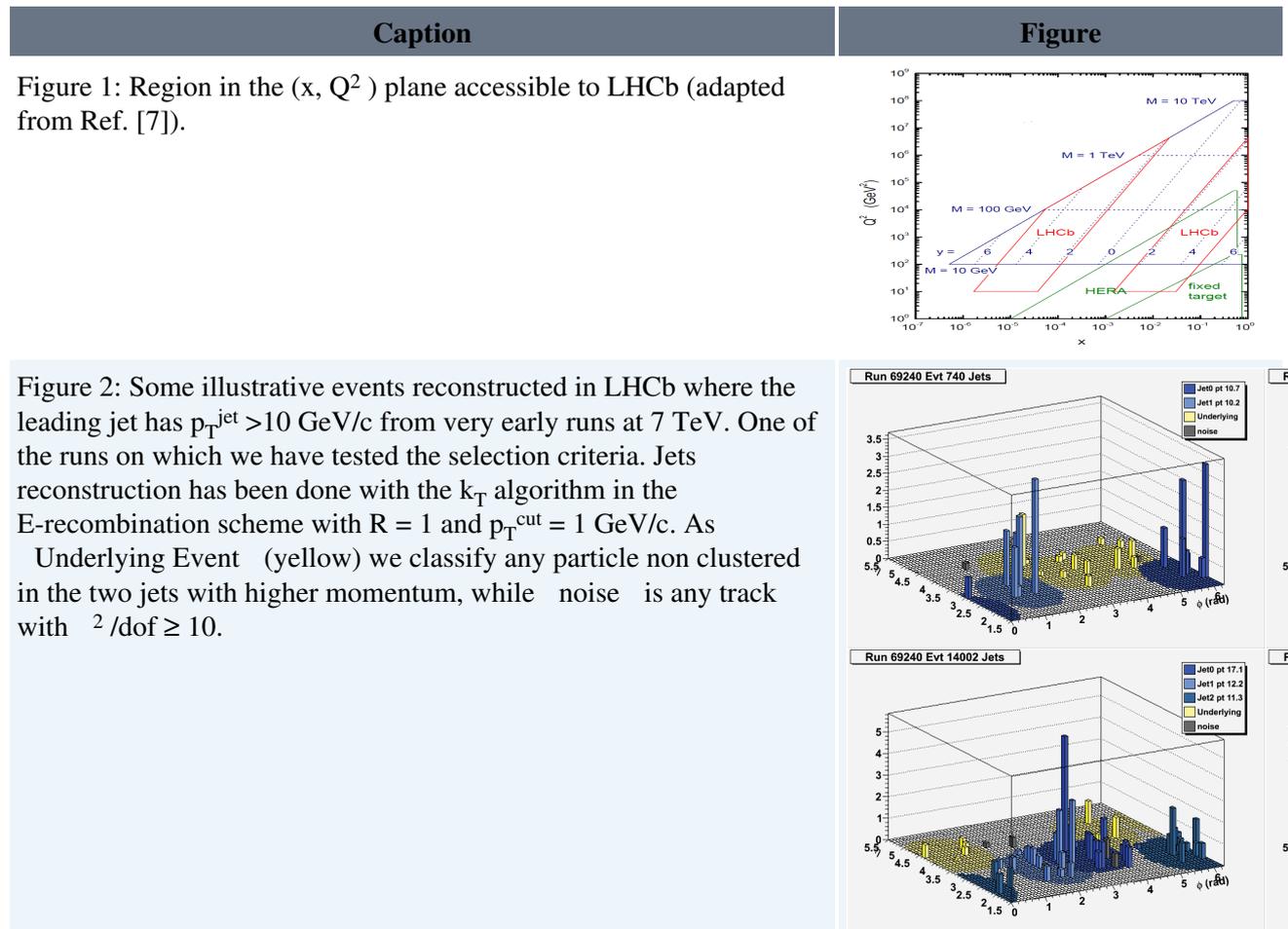


Figure 3: Normalized differential raw transverse energy distribution compared with that obtained applying the k_T algorithm to particles simulated with the LHCb Monte Carlo program (see text).

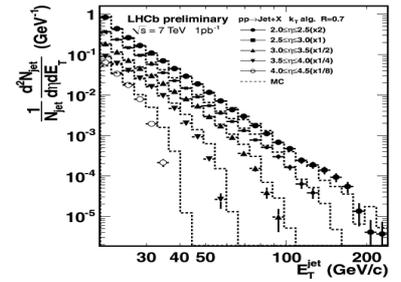


Figure 4: Distribution of the azimuthal angle difference $\Delta = \phi_{jet1} - \phi_{jet2}$ for the two leading jets in all events that have at least two jets with $p_T > 20$ GeV/c. The peak at $\Delta = 0$ is evident. The full line is the result of the fit of the data with the sum of a polynomial background (dashed line) and a Gaussian function.

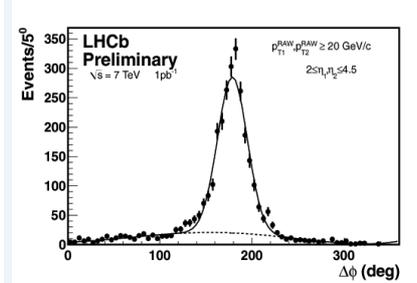


Figure 5: Differential distribution of the asymmetry parameter A , defined by Eq. (2), for the events in which the two jets have $|\Delta\phi| < 40^\circ$.

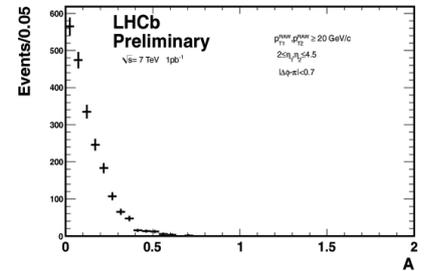


Figure 6: Invariant mass distribution for jet pairs with p_{T1} and $p_{T2} \geq 20$ GeV/c, $|\Delta\phi| \leq 40^\circ$ and $A \leq 0.2$. The dashed histogram shows the LHCb-MC (see text) simulated distribution.

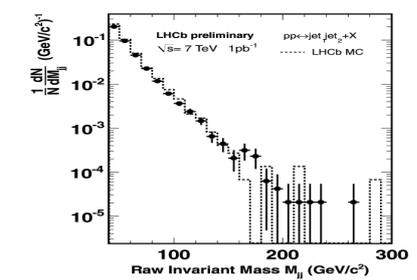


Figure 7: Range in (x, Q^2) , defined in the text, that could be experimentally accessible to LHCb through the measurement of dijets at $\sqrt{s} = 7$ TeV.

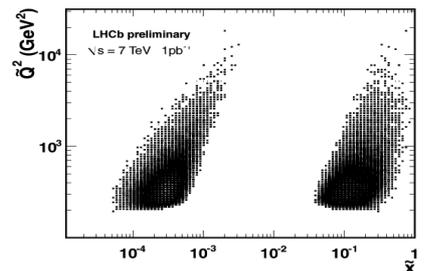
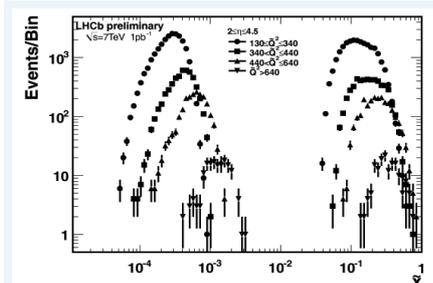


Figure 8: Dijet x distribution for various Q^2 ranges.



-- KatharinaMueller - 16 Jan 2014

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