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dijet angular distribution

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dijet angular distribution

- QCD well described by Standard Model
 - QCD jets mostly produced in the forward regions
- search for new interactions
 - investigate the existence of contact interactions
 - no mass resonances
- requires expertise from different areas: Standard Model, exotics physics signatures, reconstruction of jets and jet missing E_T
- analysis based on calorimeter jets
 - extend it to track jets
 - measure track jet resolution (and improve b-tagging efficiency)
- New J. Physics 13 (2011) 053044

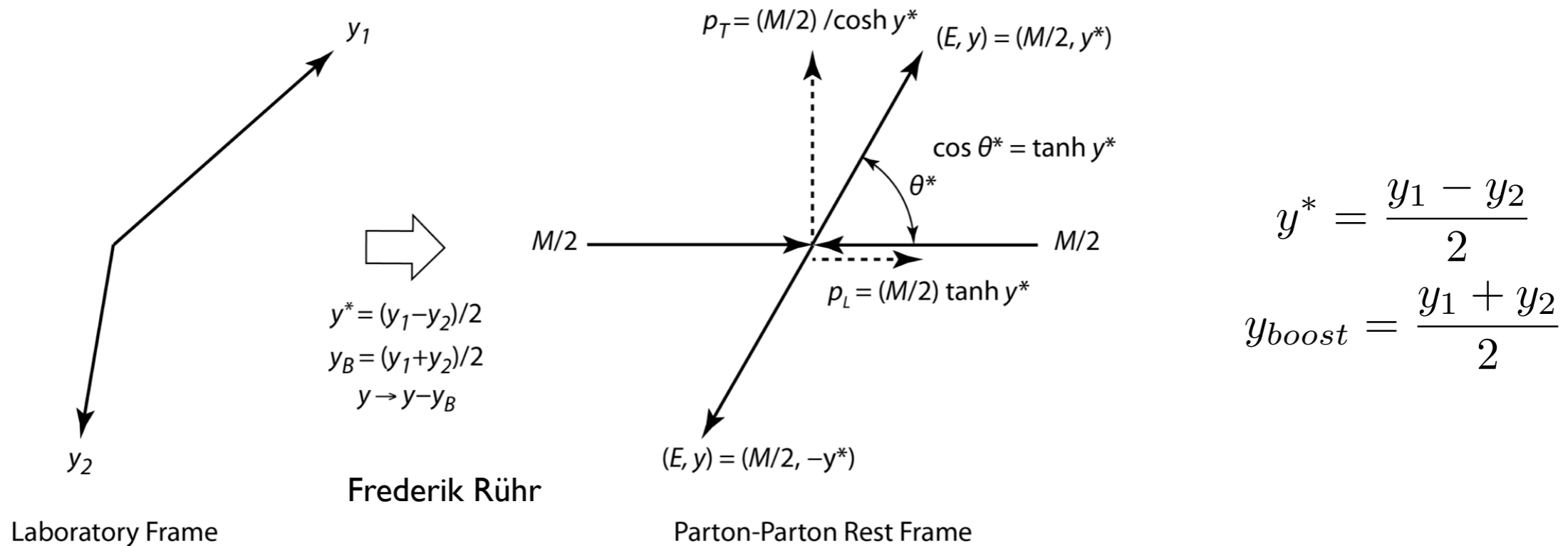
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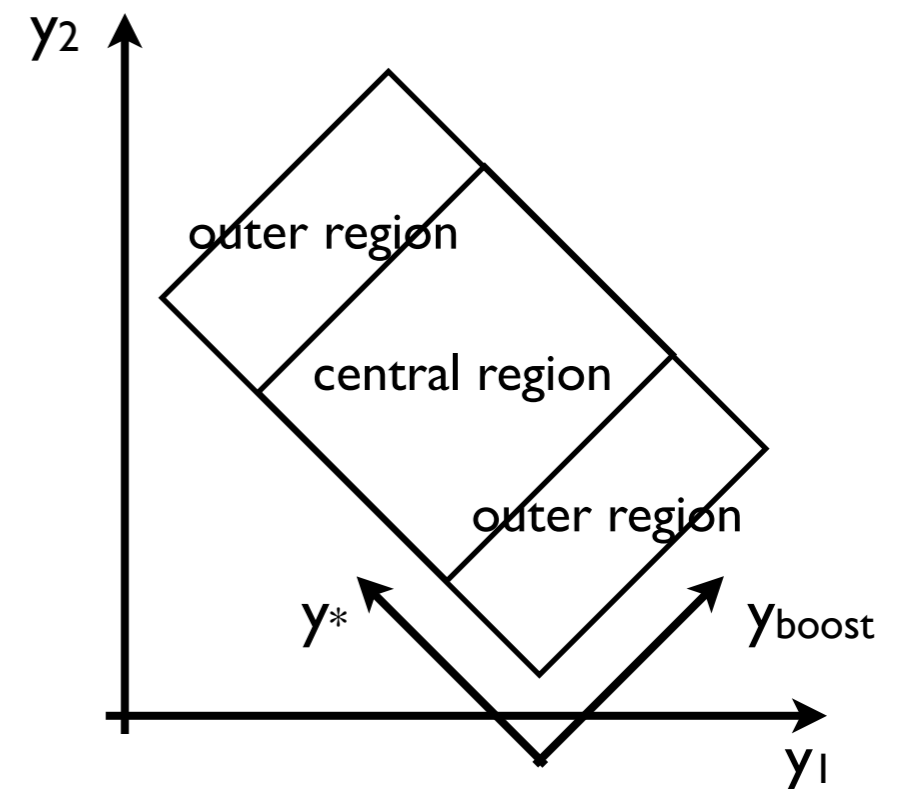
dijet angular distribution



- based on the rapidity measurement of the leading jets: y_1, y_2
- y^* is the rapidity of the two jets in the parton-parton rest frame
- y_{boost} is the boost of the dijet system in the lab frame

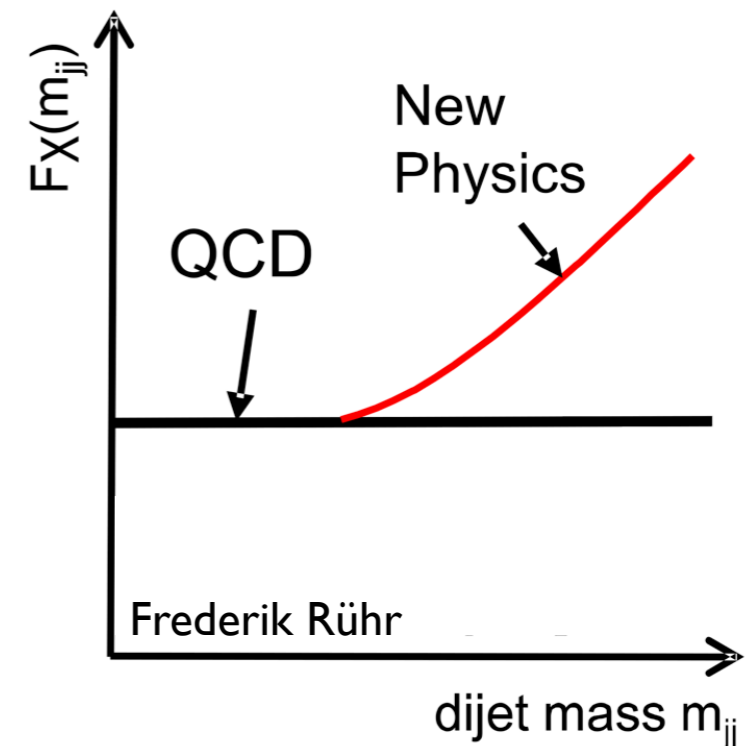
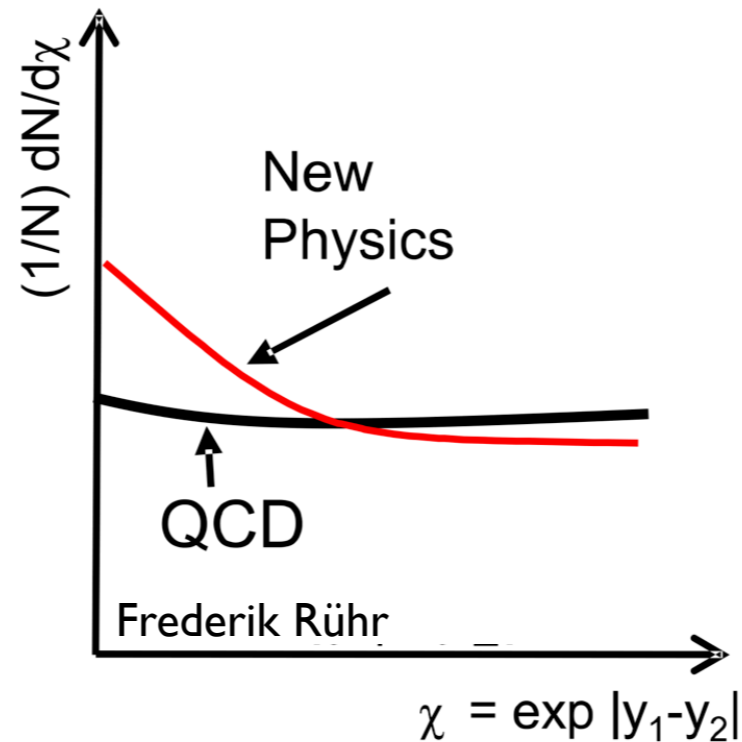
dijet angular distribution

- QCD events populate the extreme regions of the (y_1, y_2) space
- physics due to contact interactions would be isotropic, manifesting as an excess in the central region
- measure the ratio of events in the central region ($|y^*| < 0.6, |y_{\text{boost}}| < 1.1$) over the events in the outer region ($|y^*| < 1.7, |y_{\text{boost}}| < 1.1$)



dijet angular distribution

$$\chi = e^{2y^*}$$
$$F_\chi = \frac{N_{events}(|y^*| < 0.6)}{N_{events}(|y^*| < 1.7)}$$



- two angular distributions employed in the analysis: χ and F_χ
- insensitive to normalizations, JES and PDFs