The small kT region in Drell-Yan production with the PB Method

Different qs values

CASCADE developers meeting

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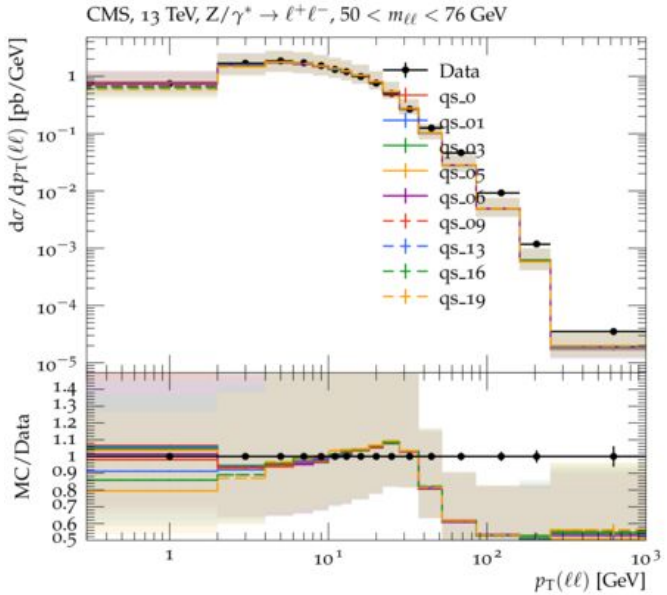
Introduction

- Results obtained from the public arXiv:2205.04897 analysis:
  - 13 TeV
  - Five mass bins from **50 to 1000 GeV**
  - Variable: **pT(*ll*)**
- Effect of different qs values: [**0, 0.1, 0.3, 0.5, 0.6, 0.9, 1.3, 1.6, 1.9] GeV**
- Details:
  - No. of jobs: **1000**
  - Channel: **combined** (ee & mumu)
  - Files: **/eos/project/l/lhc-ewwg-eos/public/lhefiles/13TeV/mcatnlo/DYbias/**
  - Set: **2**
  - Cascade: **3.3.1**
  - Rivet: **v3.1.7**
  - kt_min: **0.02**
  - QED corr: **included**
- χ^2 calculation performed -

Effect of the intrinsic k_T distribution

➔ **pT of the lepton pair** - At centre-of-mass energy 13 TeV for 5 mass bins - **50-76 GeV, 76-106 GeV, 106-170 GeV, 170-350 GeV, 350-1000 GeV** for **q_s from 0 to 1.9 GeV**



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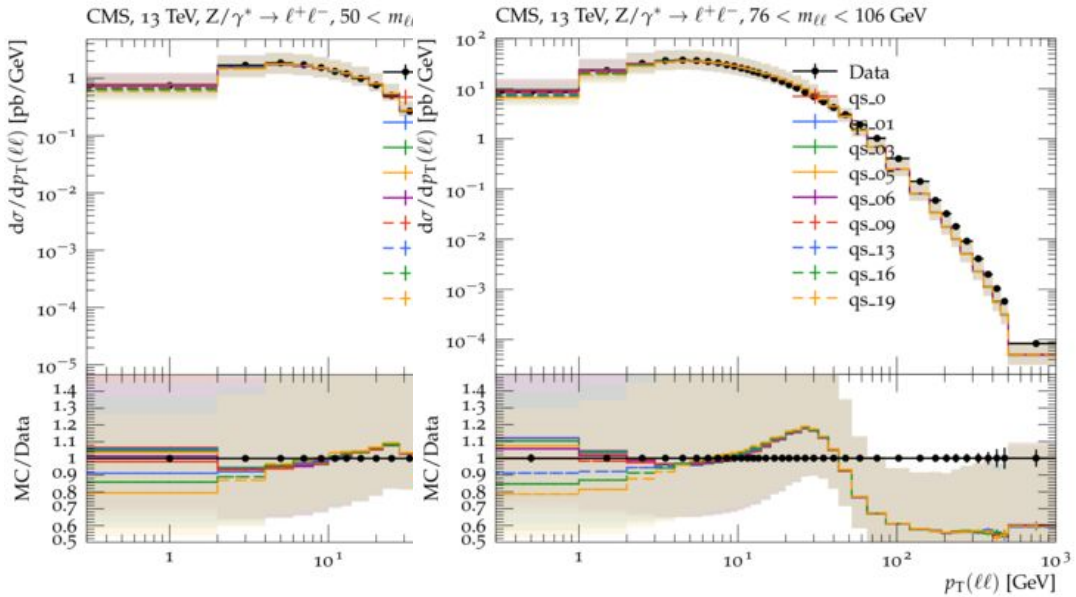

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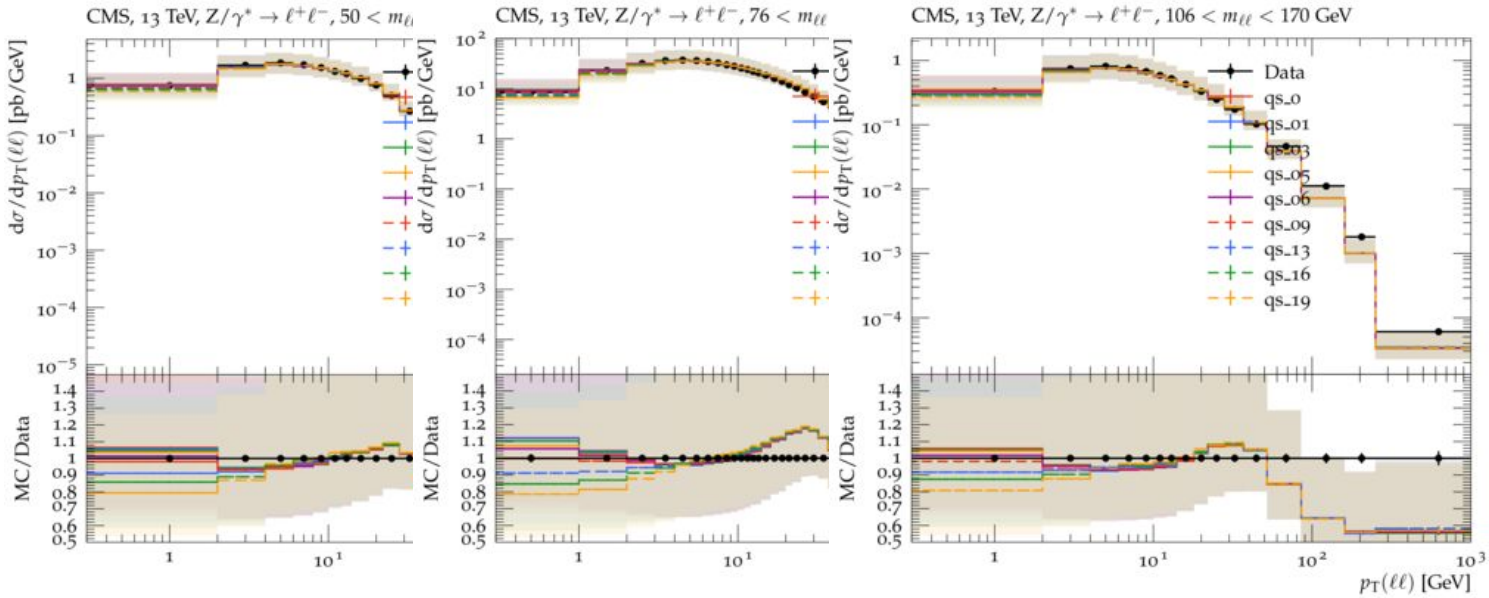

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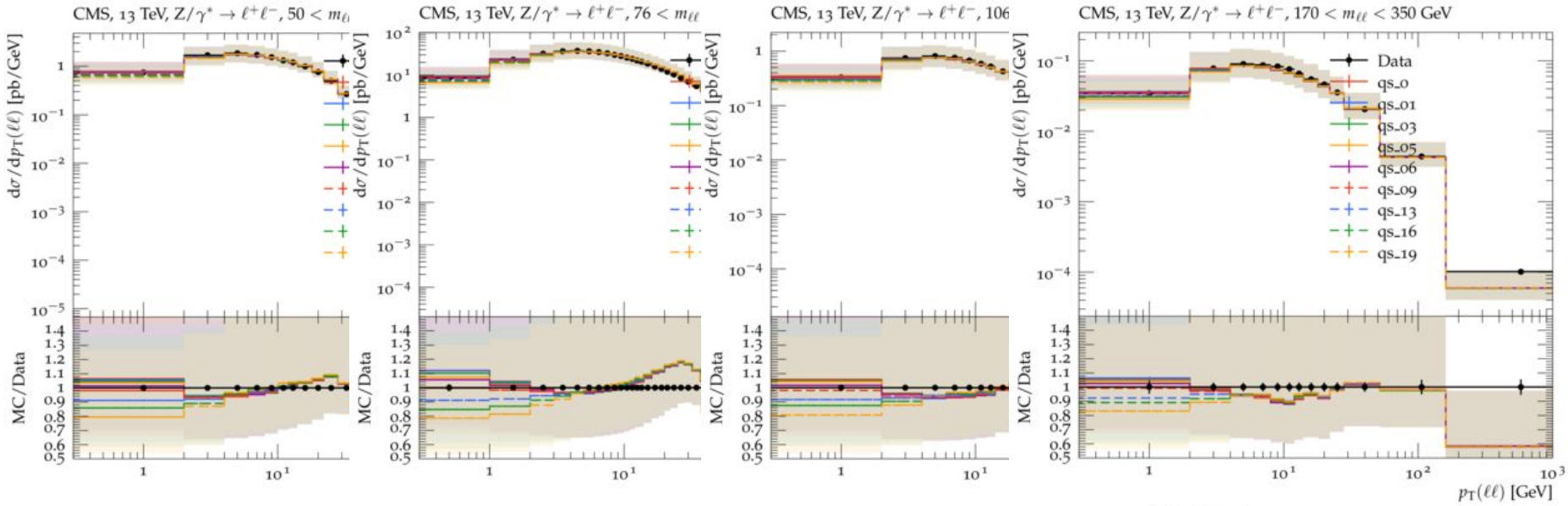

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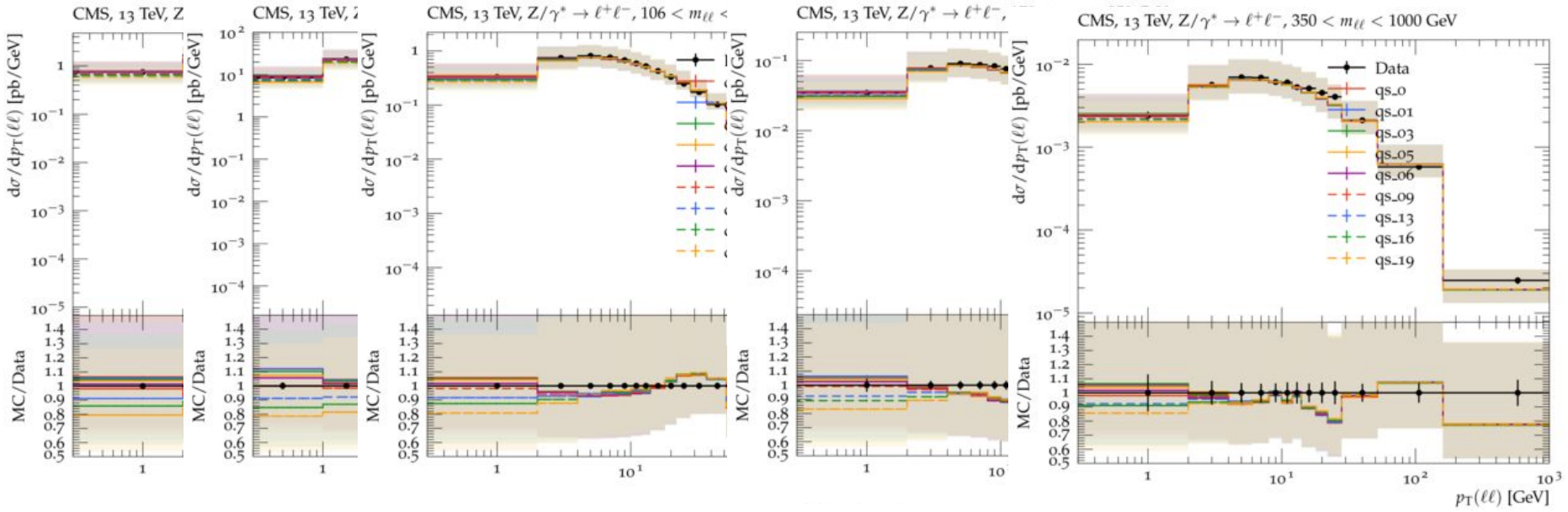

χ^2 vs. qs – 3 bins

- χ^2 calculated by using scripts from https://gitlab.cern.ch/lhcewkwg/lhcewkwg-vjets/correlations-library
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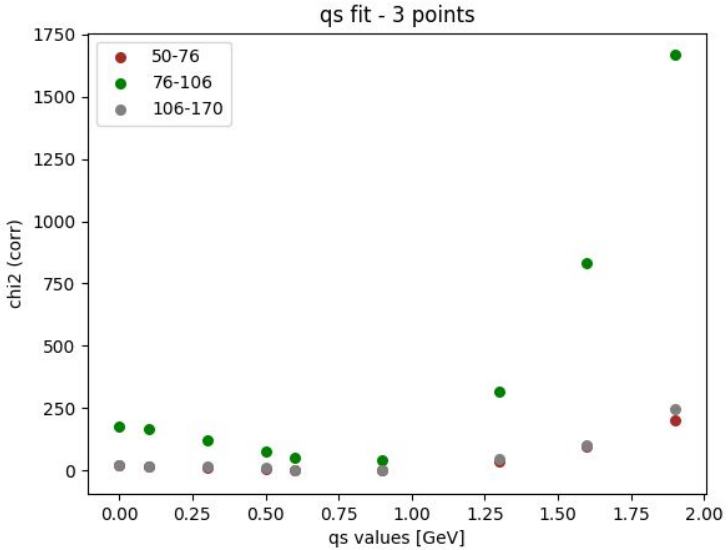

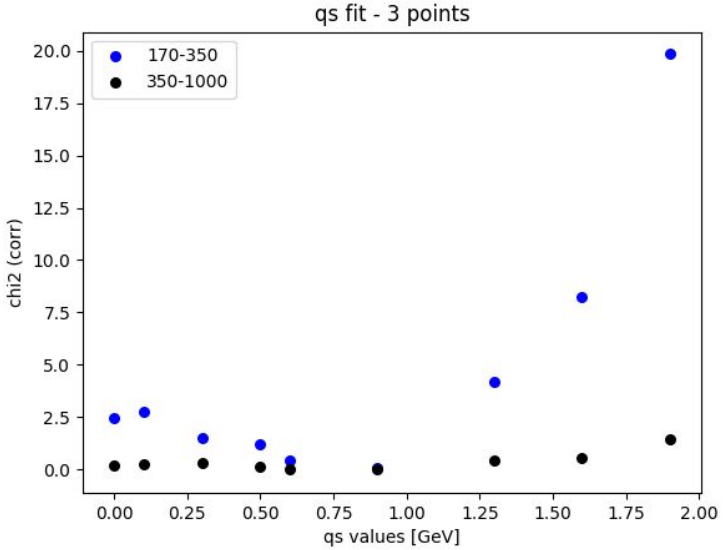

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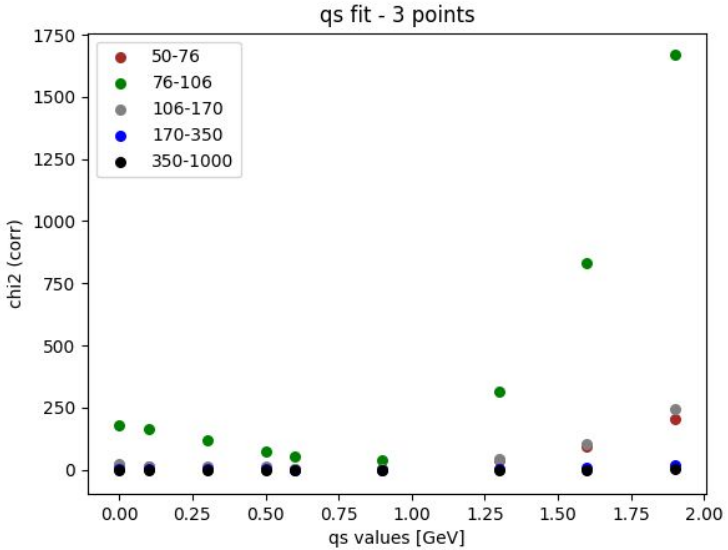

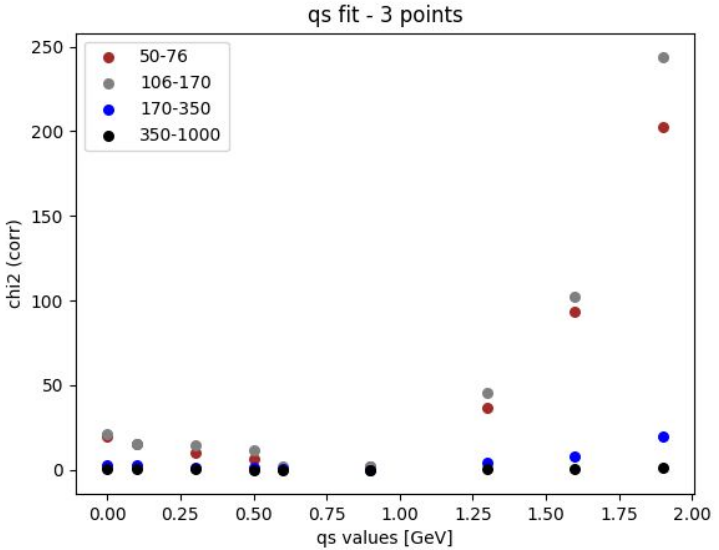

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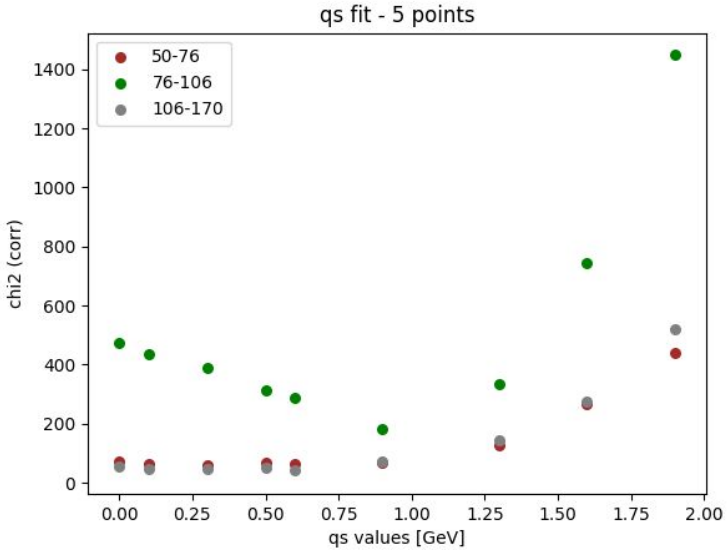

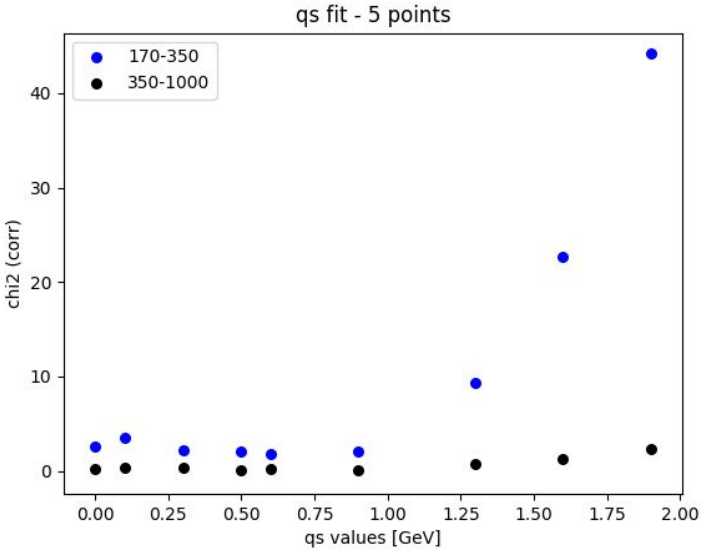

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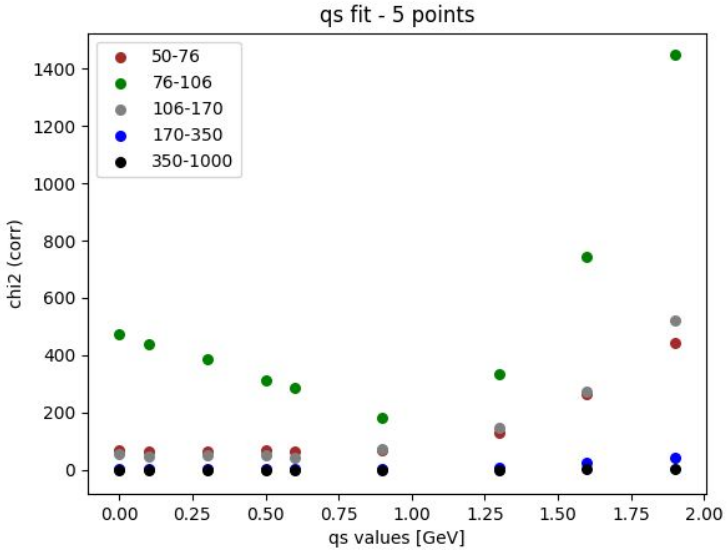

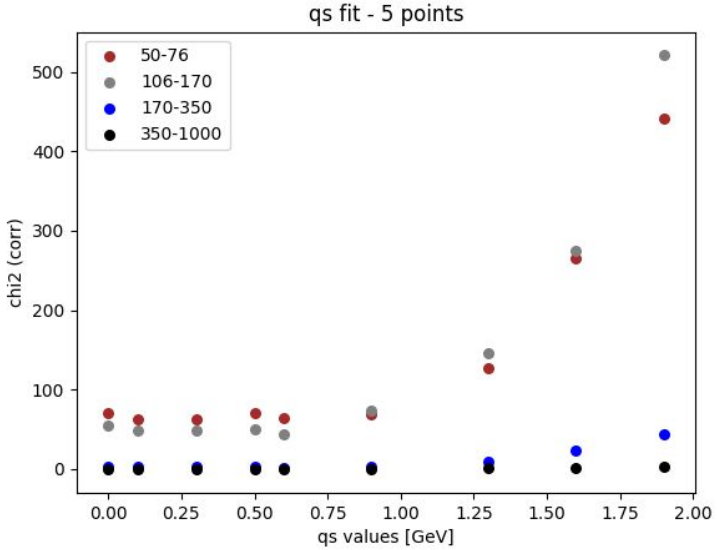

Summary

- Weak dependance for lower qs values (up to 1) for most of the mass bins
- Next steps:
    - Large values of χ^2 needs to be further investigated
    - Fit function
    - Comparison with other analysis (ATLAS & CMS 2019 - Z region)