

# CMS data analysis tutorial: Exercise 1

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## 1 Warmup

The trigger for this tutorial selects events which contain one or more muons as discussed in the documentation and explanation.

- Find out how often there is more than one isolated, reconstructed muon in data (histogram of the muon multiplicity)! Where could these additional muons come from?
- Calculate the invariant mass of two muons of opposite charge (manually and/or using the ROOT functionality of adding two fourvectors)! Only use isolated muons.
- Display the invariant mass distribution of two muons in a histogram (hint: try different axis ranges)!
- Compare your results to MC simulation (display simulation and data in the same histogram). Make sure you select triggered events only for the simulated samples!