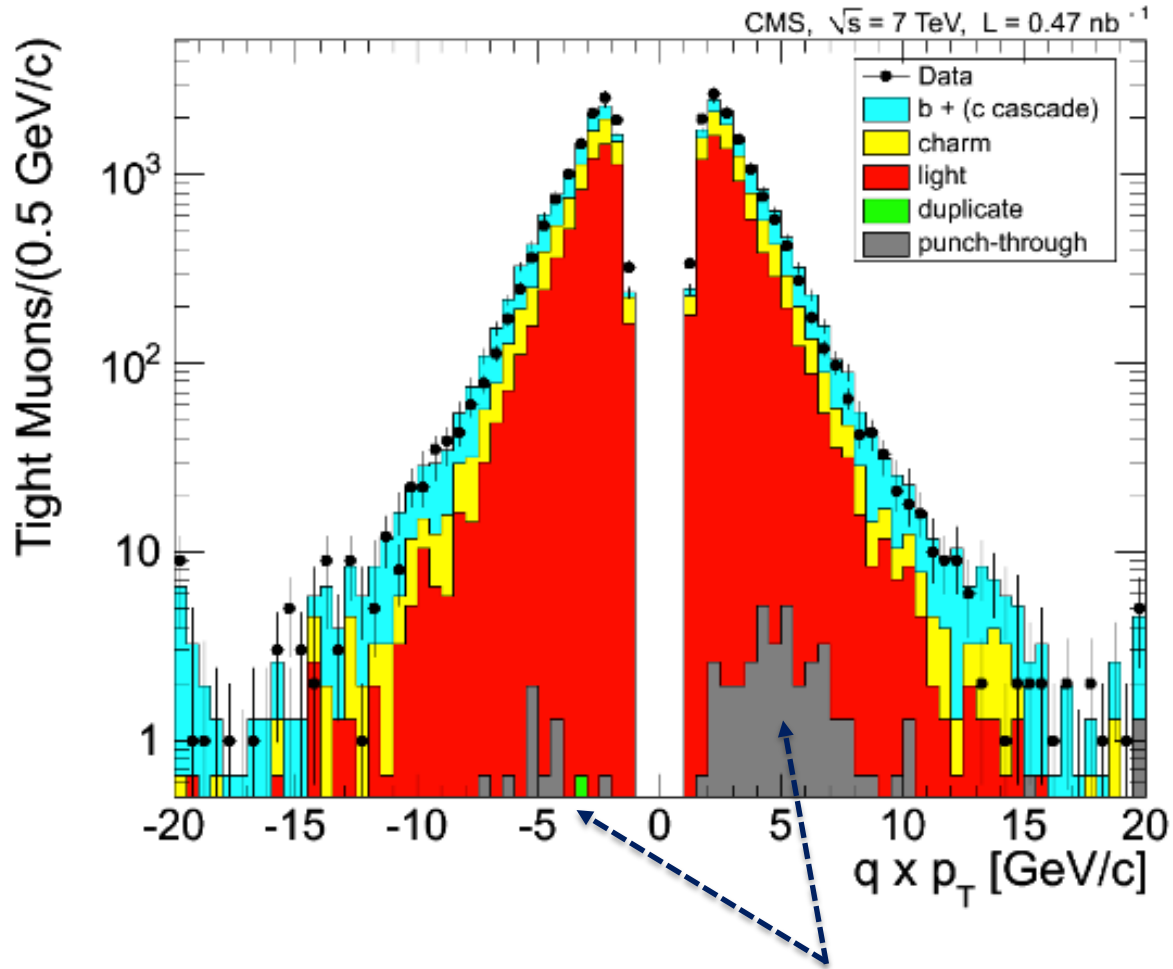


Physics Note Exercise 1 - I

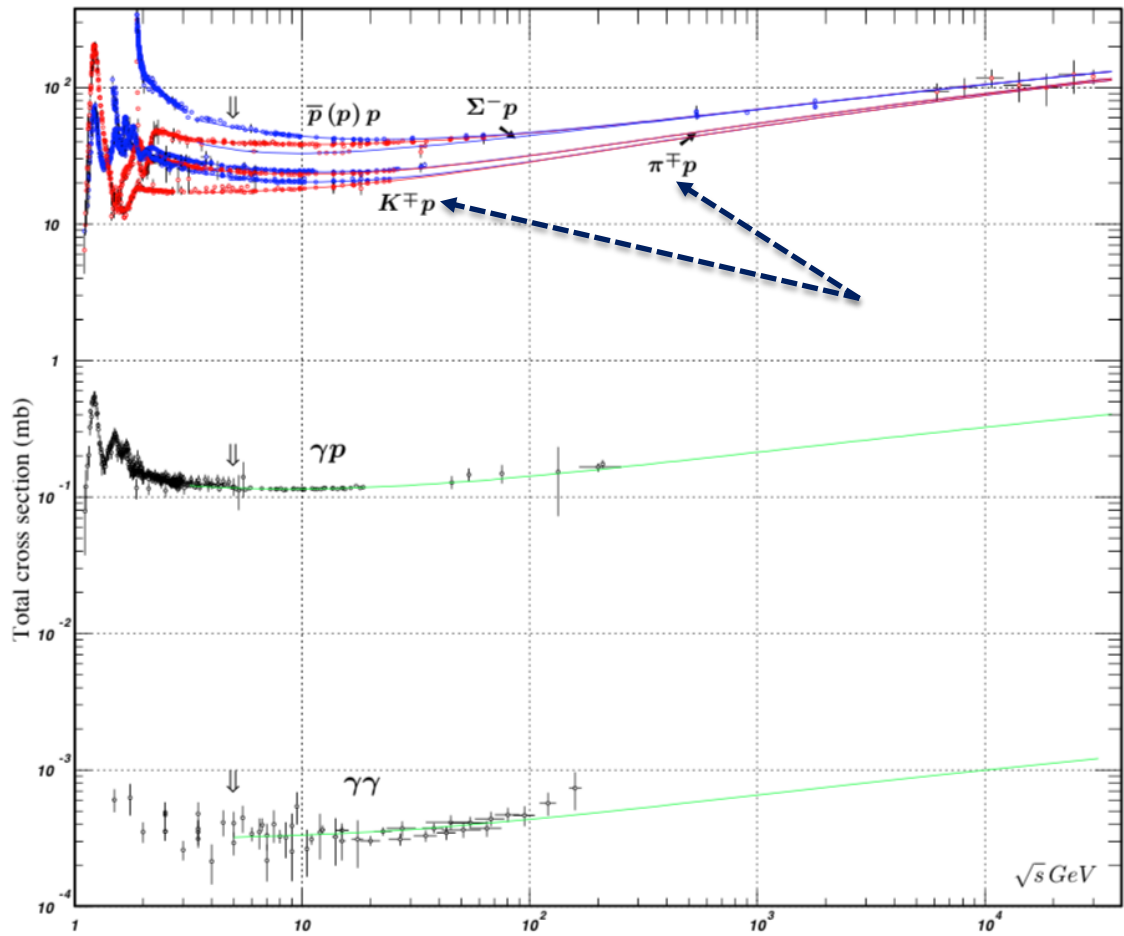
In the following plot for TIGHT muons (Fig.4 top left of the paper)



... you can notice that the grey component (punch-through) shows **a strong charge unbalance**!

Physics Note Exercise 1 - II

Considering that the main component of these fake muons are hadrons, the explanation can be derived by looking at the **cross-section of light hadrons (pions, kaons,) with protons** (i.e. the cross-section of the **nuclear interactions in the material** (sensors, magnet, cables, support structures) that hadrons, coming from the interaction region, pass-through before reaching the muon chambers. The next two plots are taken from PDG 2010 (pdg.lbl.gov):



Physics Note Exercise 3 - III

In the following plot of the same figure, it is possible to better observe that, unlike pions, kaonic cross-section differ relevantly between positive and negative charged kaons. Specifically **negative kaons** seems to have much higher probability to be “absorbed” by the material than positive kaons.

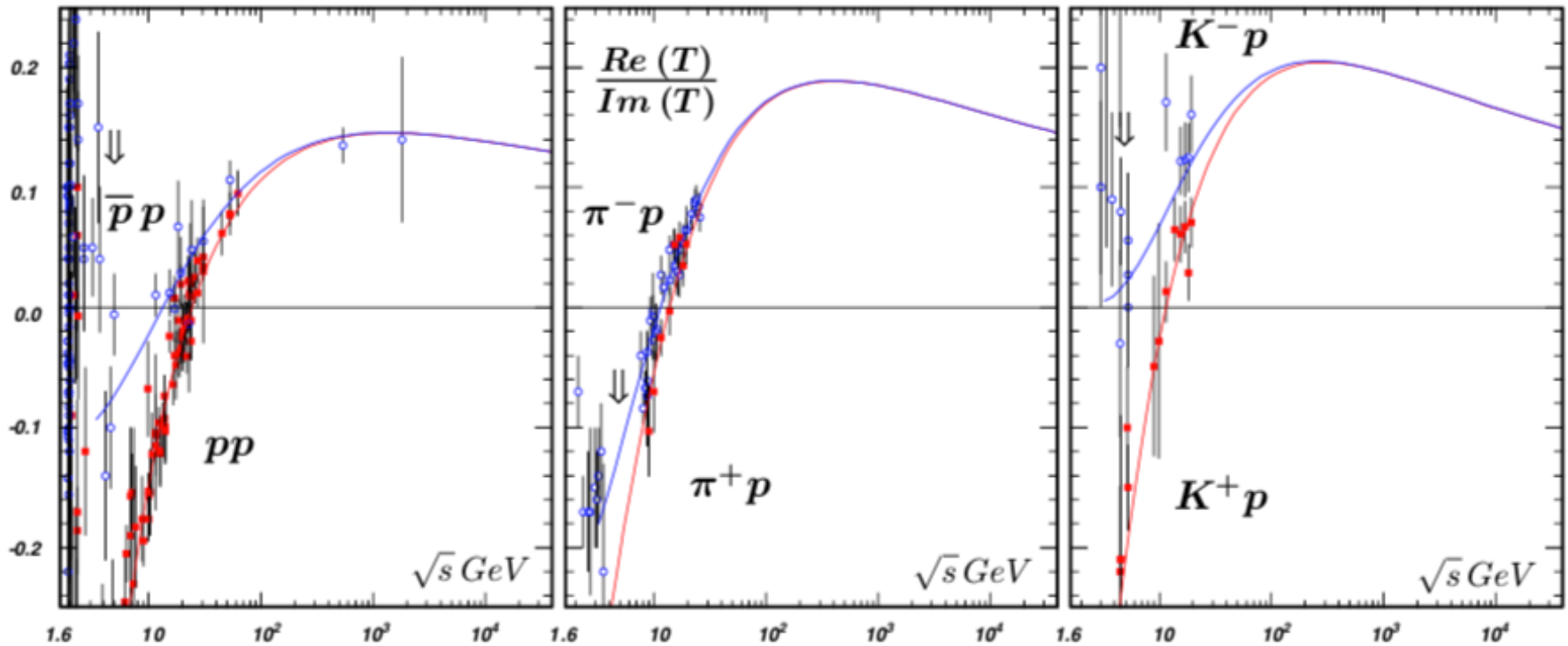


Figure 41.10: Summary of hadronic, γp , and $\gamma\gamma$ total cross sections, and ratio of the real to imaginary parts of the forward hadronic amplitudes. Corresponding computer-readable data files may be found at <http://pdg.lbl.gov/current/xsect/>. (Courtesy of the COMPAS group, IHEP, Protvino, August 2005.) See full-color version on color pages at end of book.