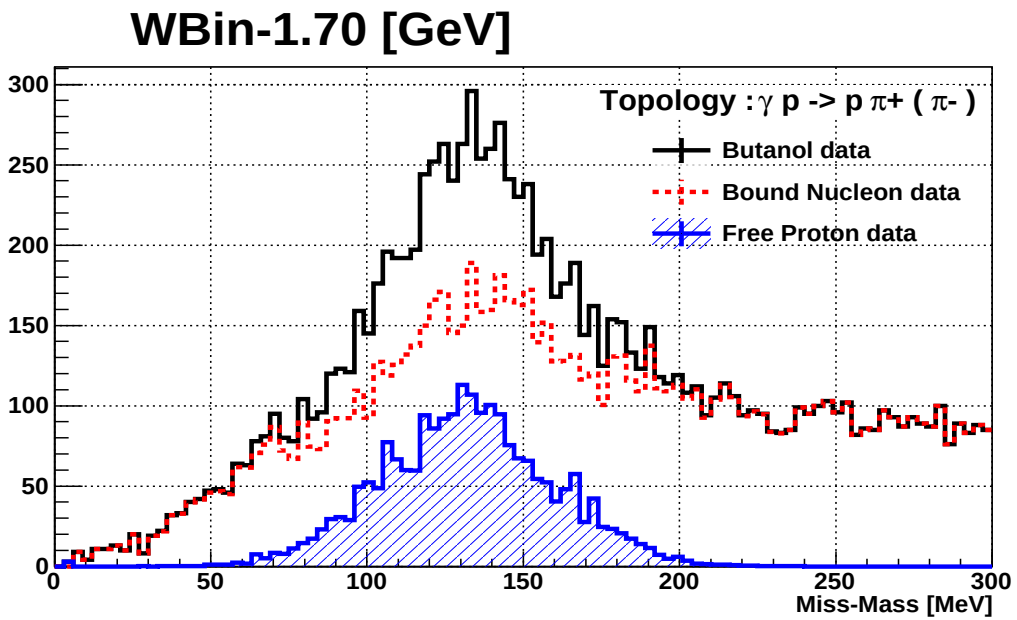
The Q-factor method with Determination of the Beam Asymmetry $I^{\odot}$ in $\gamma p \longrightarrow p\pi^{+}\pi^{-}$

- The Q-factor method is used to subtract background (developed at CMU, arXiv:0804.3382v1) :
  - The Q-factor is an event-based quality factor which describes the ration of hydrogen signal to butanol signal, i.e. an event-based dilution factor.
  - The background consists of bound carbon nucleons and other background.
- From the butanol (C_4H_9OH) data, the free proton data is extracted on an event-by-event basis. No overall dilution factor is necessary.



No Dilution Factor

Polarization Observable $I^{\odot}$ with Q-factor method

- Free proton data is extracted from the butanol data by applying Q-factor method.
- ϕ_{π^+} : the π^+ azimuthal angle in the rest frame of the π^+ π^- system
- Only statistic errors are shown.