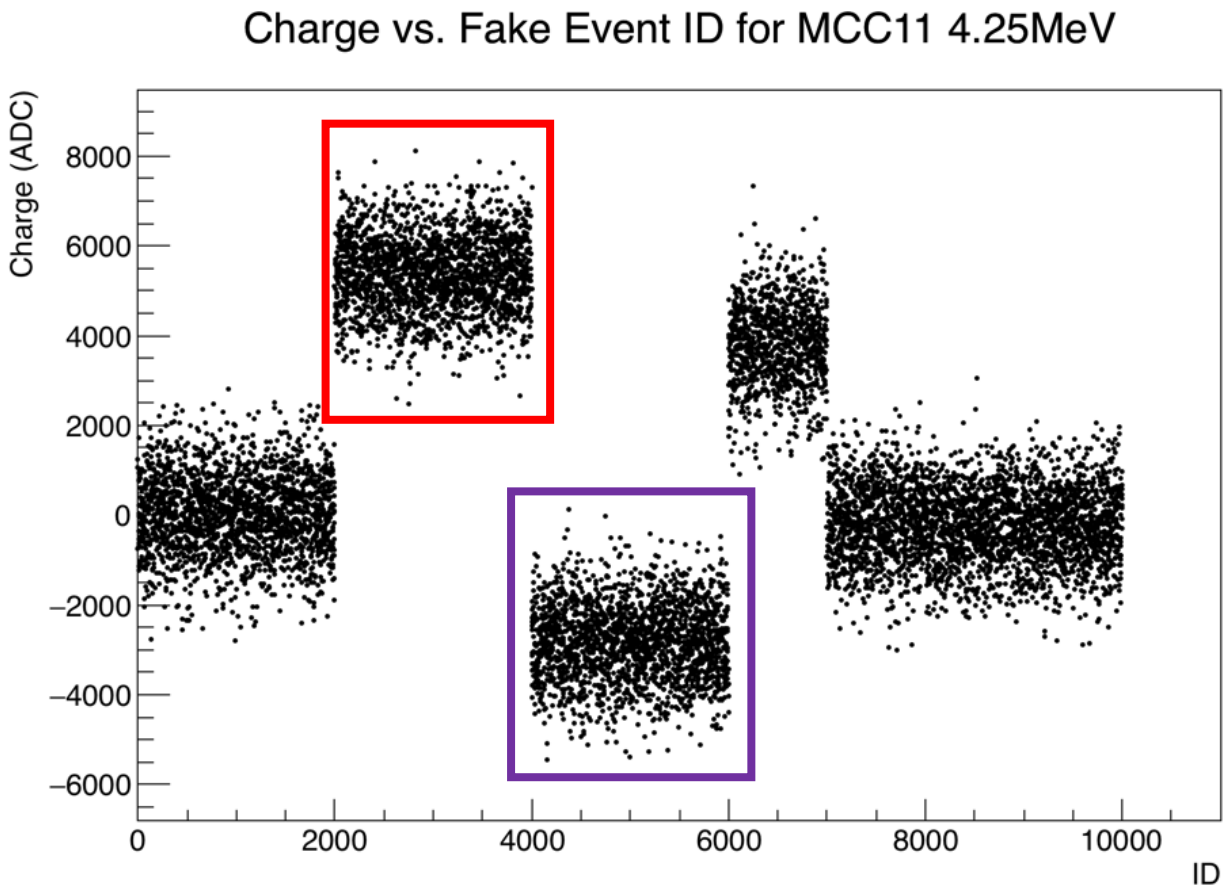
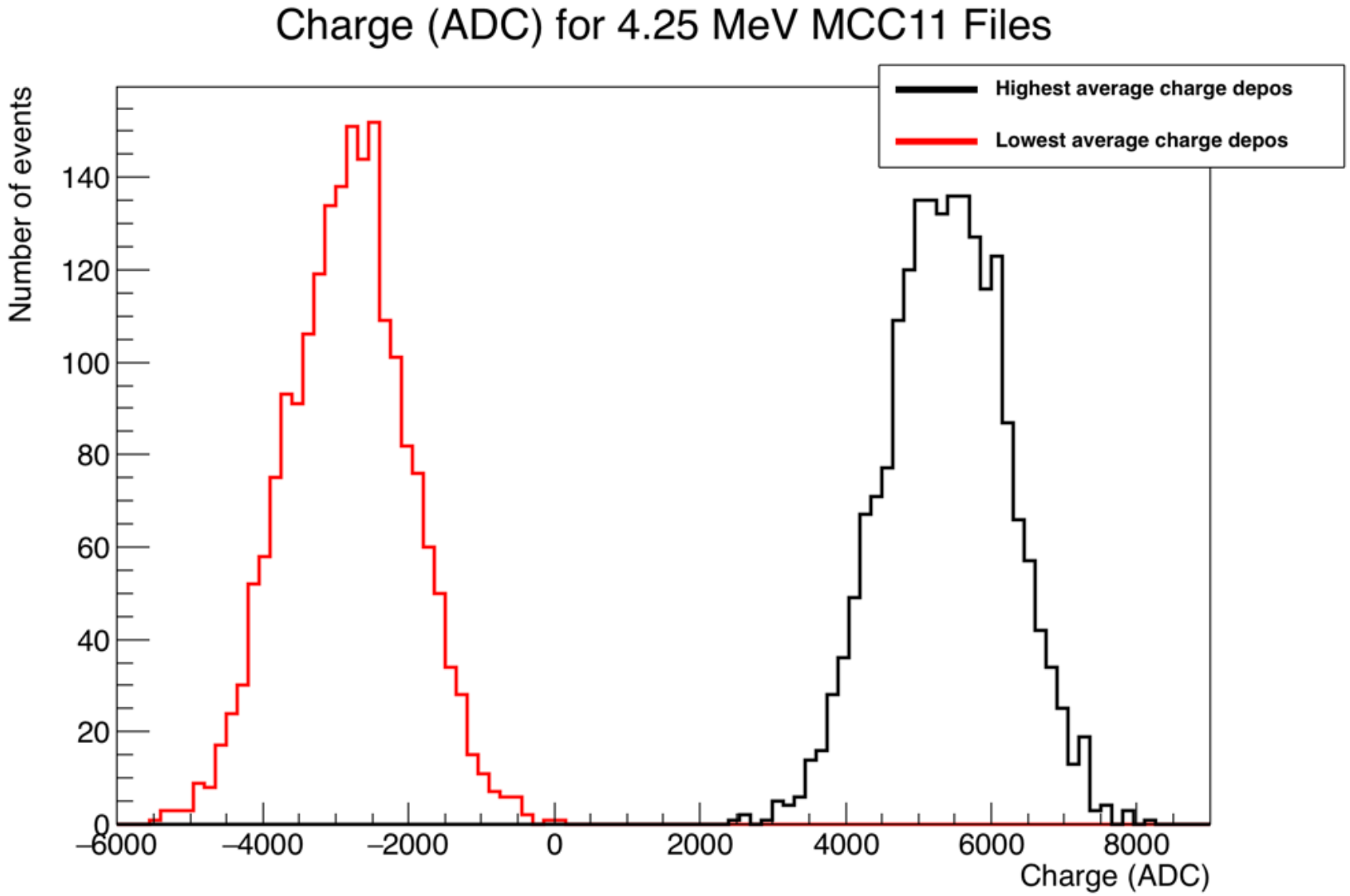
Introduction

- Goal: determine the issues in MCC11 MARLEY simulation
  - Inconsistent charge distributions between files with the same configuration parameters set
- Looking at 4.25 MeV files with biggest differences in the charge distributions
  - Red: largest average charge depositions; 2000 events in 1 file
  - Purple: smallest average charge depositions; 2000 events in 1 file



Files + their charge distributions



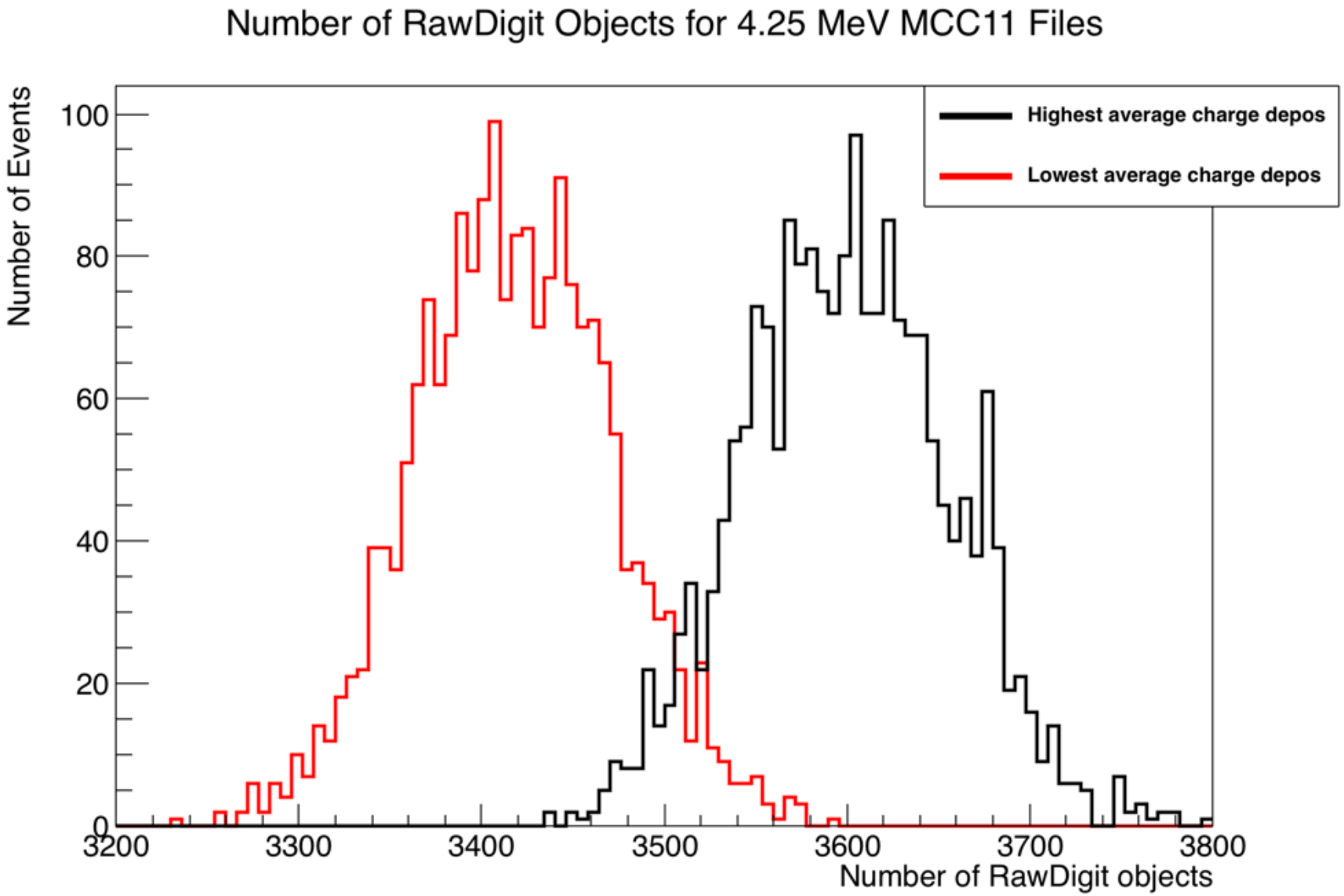
Brief overview of total charge calculation

- Each event contains a vector of raw::RawDigit objects
  - “Collection of charge vs time digitized from single readout channel”
- Each RawDigit contains a vector of ADC signals
  - “Raw charge” for each RawDigit: sum pedestal-subtracted signals
  - These pedestal-subtracted signals can be positive and negative, but ~99%
- The “raw charge” only contributes to the total charge if the RawDigit object is located on a collection wire

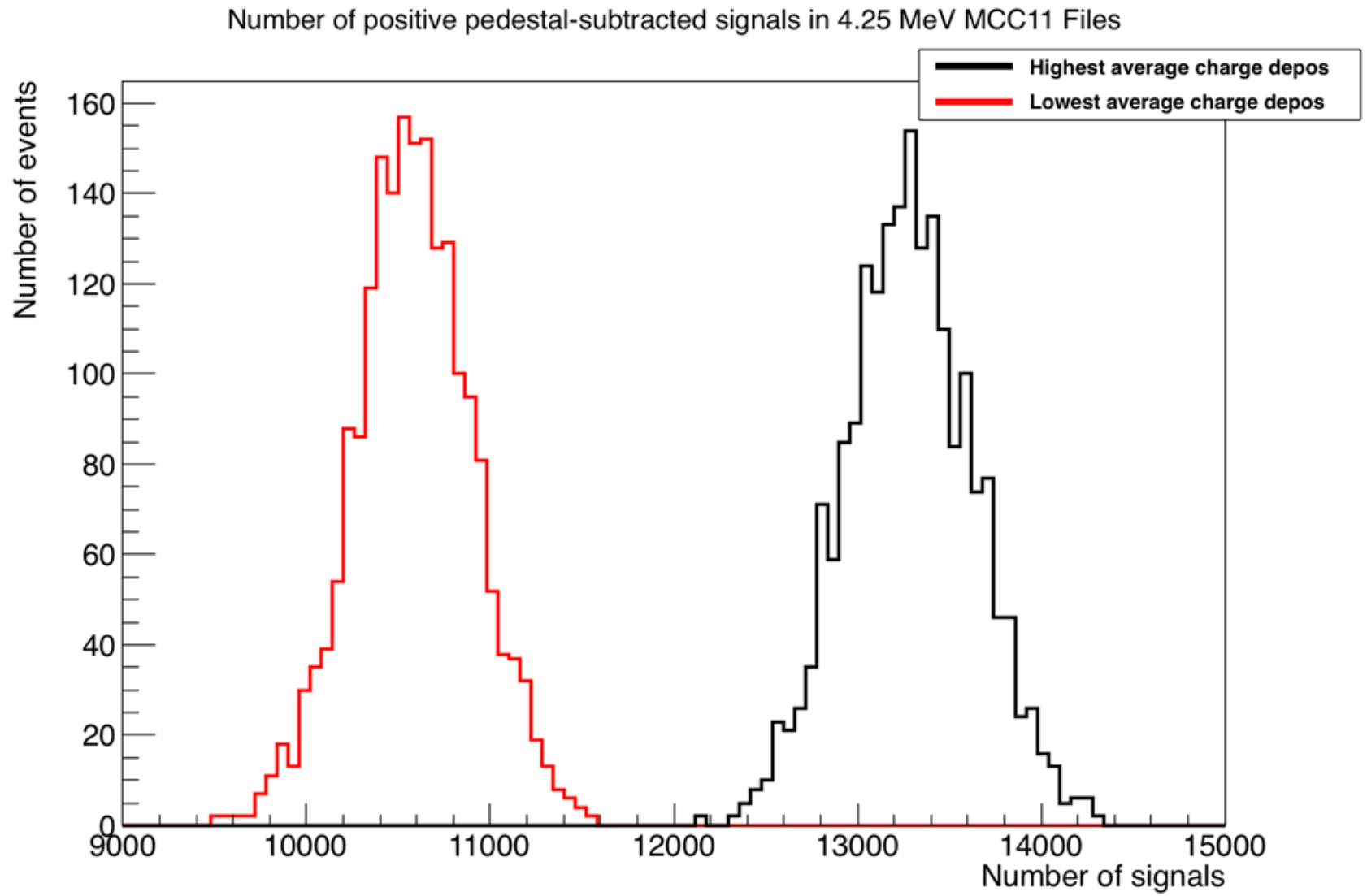
Looking at raw::RawDigit objects

- Pedestal for collection plane: 500 ADC for all events
  - Pedestal for induction planes: 1800 ADC for all events
- Searched for major differences between the two files in the charge determination:
  - Number of RawDigit objects
  - Looking at the pedestal-subtracted signals:
    - Number of positive signals
    - Number of negative signals

Number of RawDigit objects



Number of positive signals



Number of negative signals