Status Report

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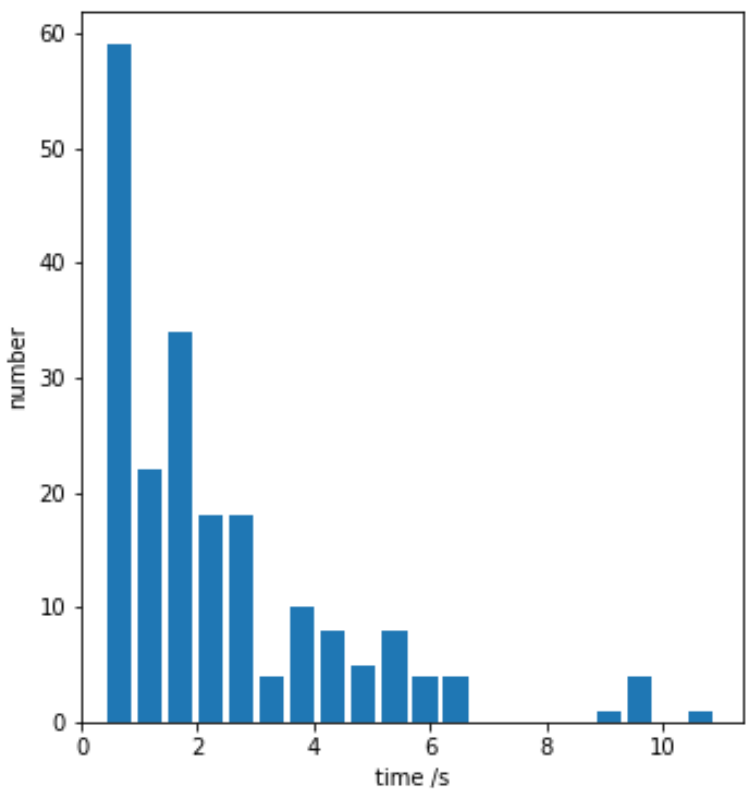
momentum reconstruction: reminder

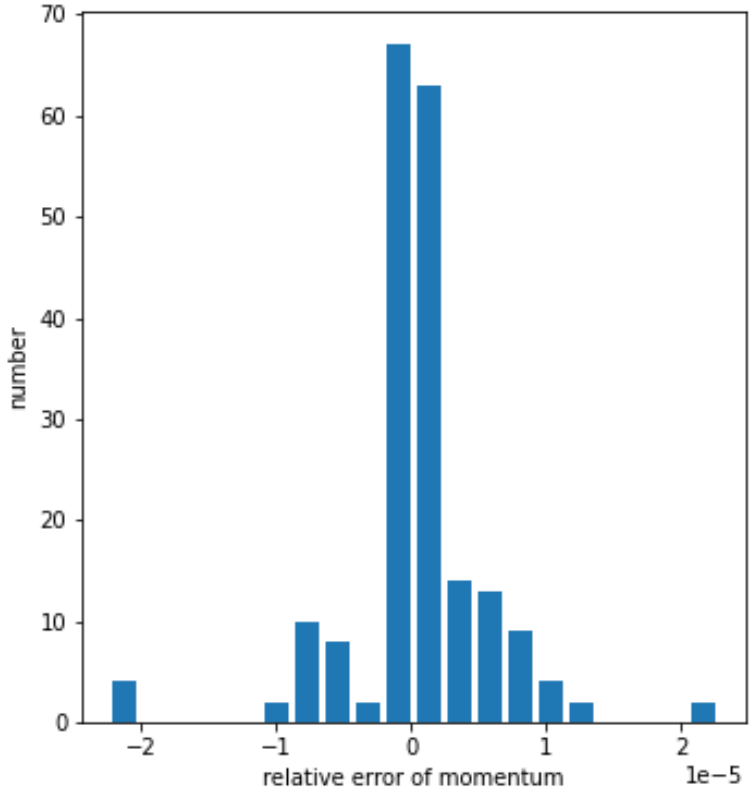
- I develop a algorithm to reconstruct momentum from OptSiren output (number of photon and angle of track segments).
- For low momentum ($< 100\ \mathrm{MeV}/c$), my algorithm has a problem that reconstructed momentum are negative.

momentum reconstruction

- If larning rate is small, low momentum samples can be reconstructed correctly.
  - However, reconstruction processes take too long time for high momentum.
- I introduced an algolithm to halve the learning rate if $\Delta p_i > 5\ \mathrm{MeV}/c$ for each iteration.
  - When deteriming the initial momentum, the loss surface for each $5\ \mathrm{MeV}/c$ is checked and the momentum corresponding to its minimum value is used as the initial value.

momentum reconstruction





- reconstructed the toy data with 50-1000 MeV uniform momentum.
  - All the relative errors are less than 10^{-5}.
  - The reconfiguration process is usually completed within 10 s.
    - The iteration is finished when the $\Delta\mathrm{loss} < 10^{-14}$.

momentum reconstruction

- ToDo:
  - Evaluate a reconstruction performance by using new fake data.
    - new fake data: given a probabilistic variation.