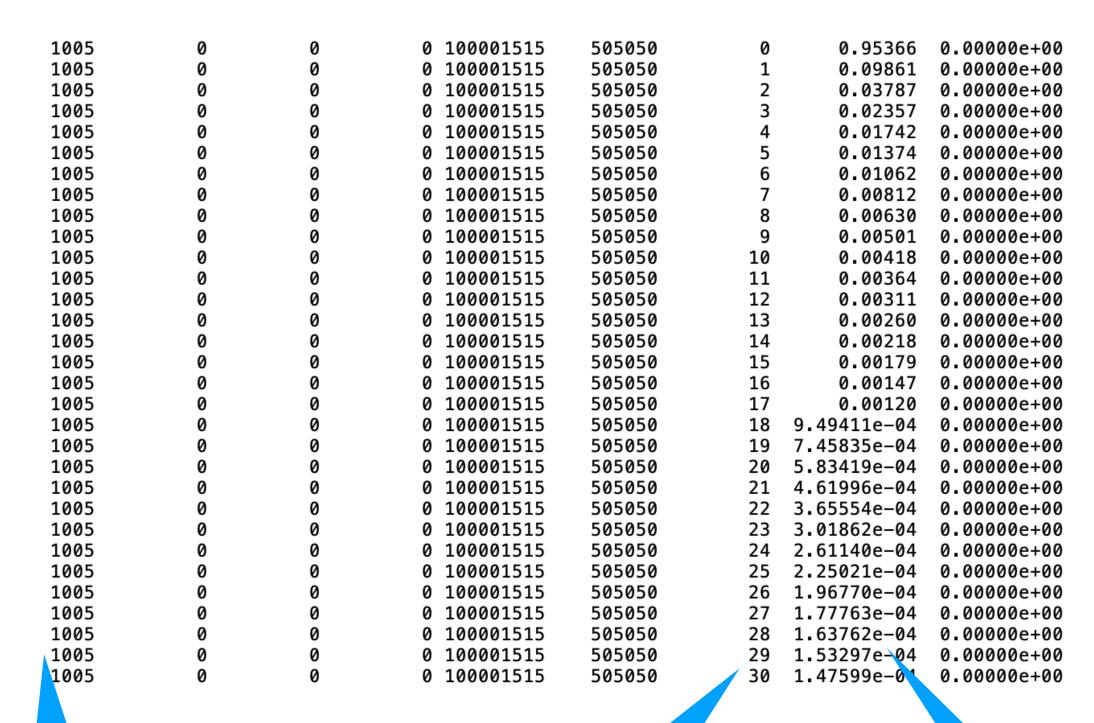
2-point correlation

Analysis of 2-pt results

An illustration:

- An aim of this training camp is to calculate 2-point correlation functions, through which one can extract physical quantities.
- The first step of this demonstration is to learn how to analyze the results.
- Typical results are shown on the right.
 - The first column: configuration number
 - The seventh column: time separation
 - The eighth column: 2-pt results



i: Configuration No.

Time separation
In Lattice unit

Ci(t)
Results for 2-pt

Analysis of 2-pt results

An illustration:

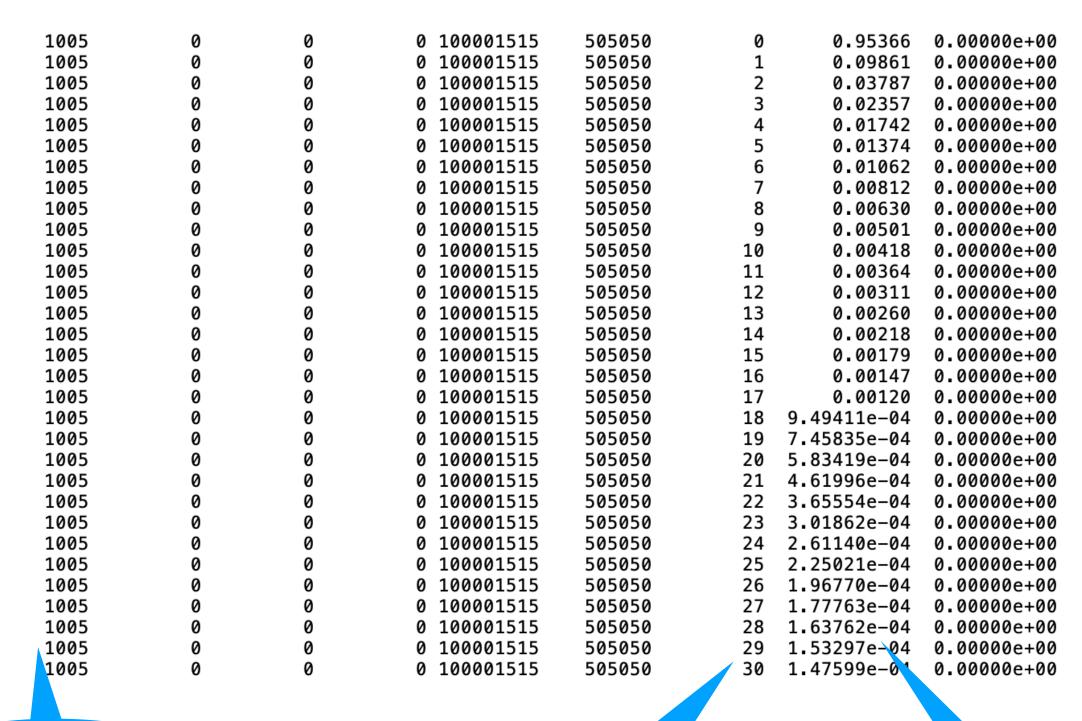
- Step 1: Read the results as $C_i(t)$, in C++ or python, i can start from 0 instead of 1005.

• Step 2: Calculate the effective mass
$$m_i(t) = a_0 \ln \frac{C_i(t)}{C_i(t+1)}$$

 $a_0 = 0.197/0.12$ is a unit-conversion factor, the unit for mi(t) is GeV

$$\hbar c = 0.197 \text{GeV} \times \text{fm}; a = 0.12 \text{fm}$$

- Step 3: calculate the average and errors of the effective mass: M(t), $\Delta M(t)$
- Step 4: plot your results



Configuration No.

Time separation In Lattice unit

Ci(t) Results for 2-pt

Analysis of 2-pt results An illustration:

- Step 4: plot your results, for an example:
- Step 5: Sometimes Ci(t)<0, what to do?

Jacknife Resampling

(to be discussed later)

