1 Relative angle distribution test runs

We use different distributions for the single particle momentum distribution to make some relative angle distributions. The single particle momenta $\vec{k}_1, \vec{k}_2$ are generated by using different distributions for their magnitude. The angles are drawn spherically symmetric. The center-of-mass (c.m.) and relative momentum are then calculated according to

$$\vec{P}_{12} = \frac{1}{\sqrt{2}}\left(\vec{k}_1 + \vec{k}_2\right) \tag{1}$$

$$\vec{k}_{12} = \frac{1}{\sqrt{2}}\left(\vec{k}_1 - \vec{k}_2\right) \tag{2}$$

The angle between $\vec{P}_{12}, \vec{k}_{12}$ is then determined trough,

$$\cos\theta_{k_{12},P_{12}} = \frac{\vec{P}_{12}\cdot\vec{k}_{12}}{|\vec{P}_{12}||\vec{k}_{12}|} \tag{3}$$

All results below show normalised distributions from 10^6 events. For each event 2 single particle momenta $\vec{k}_1$,$\vec{k}_2$ are randomly generated given a specific distribution and $\theta_{k_{12},P_{12}}$ is calculated.

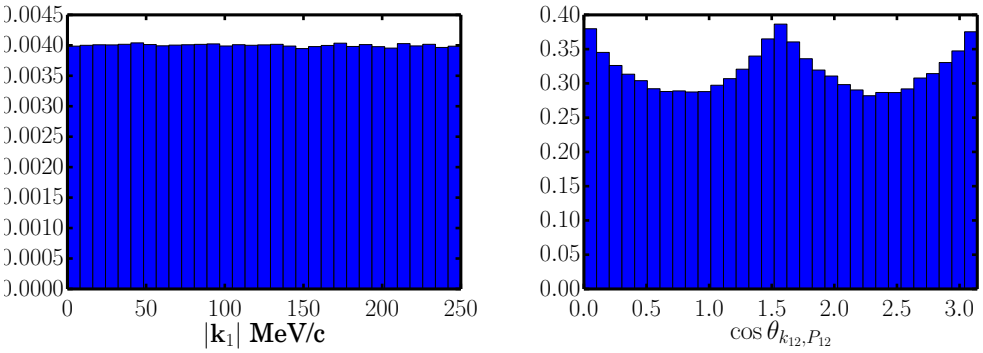

Figure 1: The single particle momentum distribution (left) is taken to be uniform between 0 and 250 MeV/c. The resulting $\theta_{k_{12},P_{12}}$ distribution is shown on the right hand side figure.

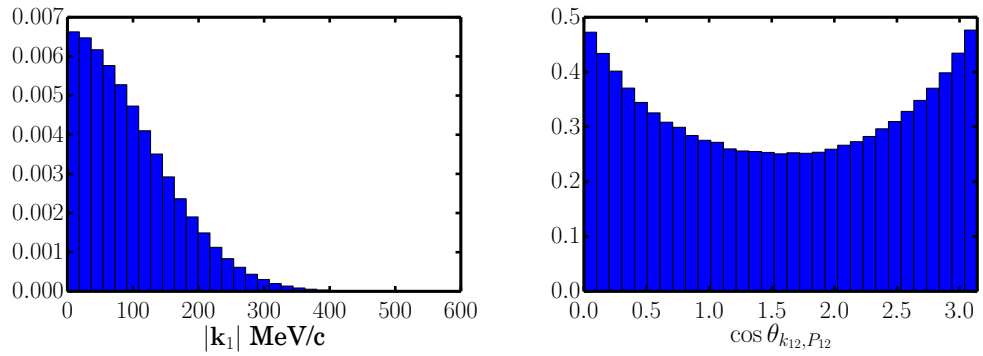

Figure 2: The single particle momentum distribution (left) is taken to be a normal distribution with width $\sigma = 120$ MeV/c. The resulting $\theta_{k_{12},P_{12}}$ distribution is shown on the right hand side figure.

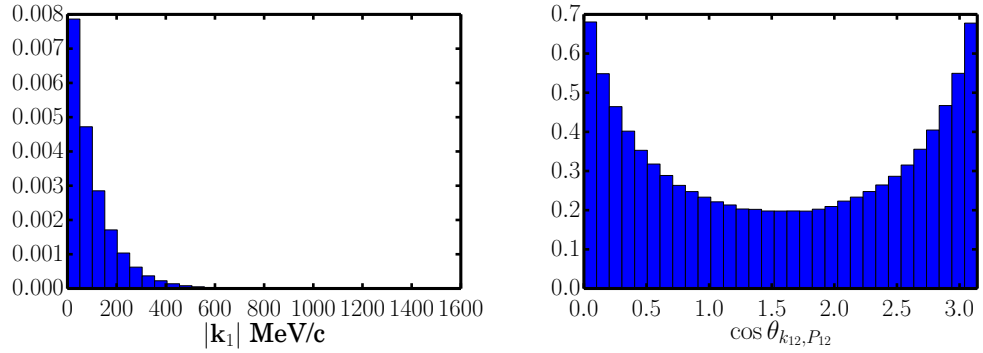

Figure 3: The single particle momentum distribution (left) is taken to be an exponential distribution $\propto e^{-\lambda|\vec{k}|}$ with $\lambda = \frac{1}{100\mathrm{MeV/c}}$. The resulting $\theta_{k_{12},P_{12}}$ distribution is shown on the right hand side figure.

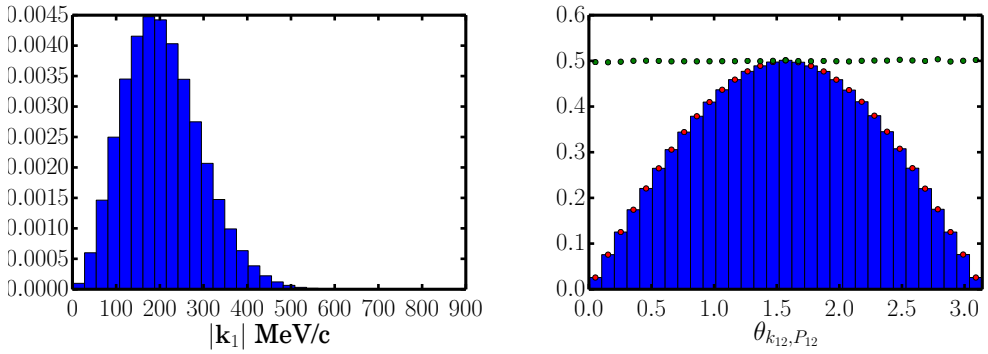

Figure 4: The single particle momentum distribution (left) is taken to be a maxwell boltzmann distribution. Each component x, y, z is distribution according to a Gaussian with a width of 130 MeV/c. The resulting $\theta_{k_{12},P_{12}}$ distribution is shown on the right hand side figure. The green dots show the result corrected for phase space (divided by $\sin\theta_{k_{12},P_{12}}$).