

Event List

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Event List at *http://www.physics.umn.edu/emaher/New_Events/New_Events.html*

This list is intended to be an informal record of information about events and the progress made on locating them. I have posted the information I have on all these events, such as whether they have been found. If they have not been found, I have posted any information I have acquired about them while trying to locate them. I would like this list to be useful for everyone, so let me know if you have any suggestions about what to add. I intend to do another list for the not yet found events.

Calculating the probability that event 3334_19920 is a tau trident event

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Steps:

1. Calculate the probability that this event is a tau decaying into three particles.
2. Calculate the probability that this event is a charm decaying to three particles.
3. Calculate the probability that this event is a scattering event.

Calculating the tau probability

Calculate the probability density of this being a tau event using event parameter analysis:

I did this using a list of weighted tau events. I made cuts on the θ angle and the ϕ angle, such that the remaining events had θ and ϕ within some range, $\Delta\theta$ and $\Delta\phi$. I made a list of these events. I then took each event and used its momentum to generate a distribution of decay lengths. I then chose one of these decay lengths randomly and recorded this event with its length and momentum. I made a length cut on these events such that the events would have decay lengths which fell into ΔL . Then I found the sum of the weight of the events that passed the angle cuts and divided this by the total weight of the events in the tau list. I multiplied this by the sum of the weights of the events which passed the length cuts and divided by the sum of all of the events in this length list. I then divided by $\Delta\theta$, $\Delta\phi$. and ΔL , and this gave me my probability density. I calculated this to be 0.397 per $rad^2 - mm$.

Calculate the prior probability of this events being a tau event.

I did this by multiplying the fraction of tau events in our sample by the fraction of tau that go to trident events. I calculated this to be 0.00759.

Calculating the charm probability

Calculate the probability density of this being a charm event using event parameter analysis:

I used the same method as described above, but the file I started was made up of D , D_s , and Λ_c particles.

Calculate the prior probability of this events being a charm event.

Still working on this. I need to get measured values for the 3-prong branching ratios for the D , D_s , and Λ_c mesons since they are not well defined in the particle data book.

Scattering Probability

Still working on this part.

So far I have obtained a list of typical hadrons that would be the background source (mostly π 's and K's). I have used the e872 mc code to simulate these hadrons moving through 1 mm of steel, and I am looking for events which result in three particles coming out of the steel.