Monte Carlo Simulations of a Magnetic Spectrometer

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This memo describes how to run the simulator and how the program is constructed.

1. How to Run the Simulator

The simulator program is called **simulate** in */usr/shippert/monte* on THOR. To run:

% **simulate** *[infile]*

The format of *[infile]* is as follows. The first line contains an integer number of events to create. The second line contains an integer describing the charge (Z) of the simulated particles. The last line contains a series of integer/floating point pairs that give the mass (A) distribution and the probabilities associated with each mass. Obviously, the probabilities really should sum to 1. See the last section of this memo for a detailed example, including a sample input file.

The output files that are produced basically give the measured value of a given variable describing the simulated event. The output filenames are given by *[infile].<suffix>*, so that:

[infile].Rm
— gives the measured rigidity.

[infile].tof
— gives the measured time of flight.

[infile].A<i>
— gives the calculated mass for the <*i*>th Cerenkov counter.

[infile].At
— gives the calculated mass for the time of flight mechanism.

[infile].Af
— gives the mass calculated using all the Cerenkov counters plus the time of flight, added in quadrature and weighted inversely by their errors.

[infile].Lm<i>
— gives the observed number of photoelectrons for the <*i*>th counter.

All the output files are floating point binary files.