Fit Exercise 1

- Generate 2 angles, x and y, randomly between 20 and 80 degrees with a flat distribution and a third angle using the relation z = 180 - (x + y)
- Assume the uncertainties of x, y and z to be the same (2 degree)
- Smear x, y and z with these uncertainties assuming Gaussian distributions to get measured values x1, y1 and z1
- Re-determine x, y and z from the smeared values x1, y1 and z1 using the constraint equation to get x0, y0, z0
- Repeat this for 1000 events and plot distributions for x-x0, y-y0, z-z0 to be compared with x-x1, y-y1, z-z1

Fit Exercise 2

- Generate a set of 4-momenta for a pair of photons from decays of 5 GeV pizero going in a direction given by theta = 60 degree and phi = 45 degree

- Assume the photons are measured in a calorimeter with an energy resolution of 1%, theta and phi resolutions of 0.5 degree.

- Reconstruct back the pizero momenta using the constraint equation that the effective mass of the two-photon system will be pizero mass (0.1349739 GeV).

- Use a sample of 1000 photon pairs and plot the measured and fitted mass of the two-photon system

Fit Exercise 3

- Consider the process of W-pair production in an electron-positron collision (the two W's going back to back and the total energy of the W's is 189 GeV) and both the W's decay to a pair of jets (use theta and phi of the first W to be the same as that of the pizero in exercise 2)

- Jets are measured in the calorimeter with an energy resolution of 10%, theta and phi resolution as in the previous exercise

- Generate a sample of 1000 such events and then reconstruct back W-mass using energy-momentum conservation constraint

- Add a second constraint that both the W's have the same mass

- Compare the measured mass versus fitted mass from the two sets of fits