Study of Fragmentation Products from the Reaction 800 GeV p + ^{197}Au

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Scientific Motivation

The group has been involved in extensive experimental studies of mass and angular distributions in proton-nucleus and nucleus-nucleus collisions. Measurements have been focussed on target fragmentation, using well-known inclusive off-line gamma ray spectroscopy. The group has recently done experiments at BNL (14.5 A GeV ^{16}O + ^{197}Au) and CERN (60 and 200 A GeV ^{16}O + ^{238}U). A clear transition from fissionlike processes at low beam energies to multi-fragmentation processes at high beam energies is observed. Also, the concept of limiting fragmentation at high energies has been confirmed in both pA and AA collisions.

This experiment (800 GeV p + ^{197}Au) will help us to try to understand the reaction mechanisms in relativistic pA and AA collisions, and it will give us data to compare with our previous experiments.

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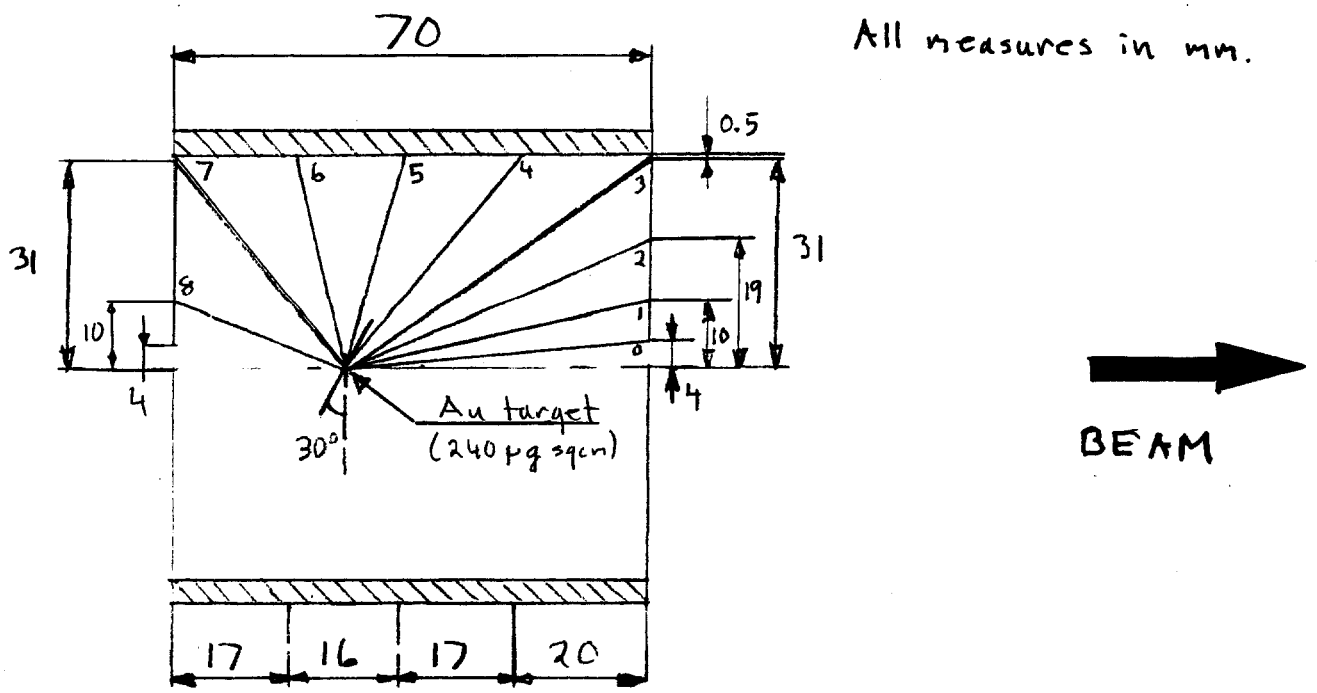
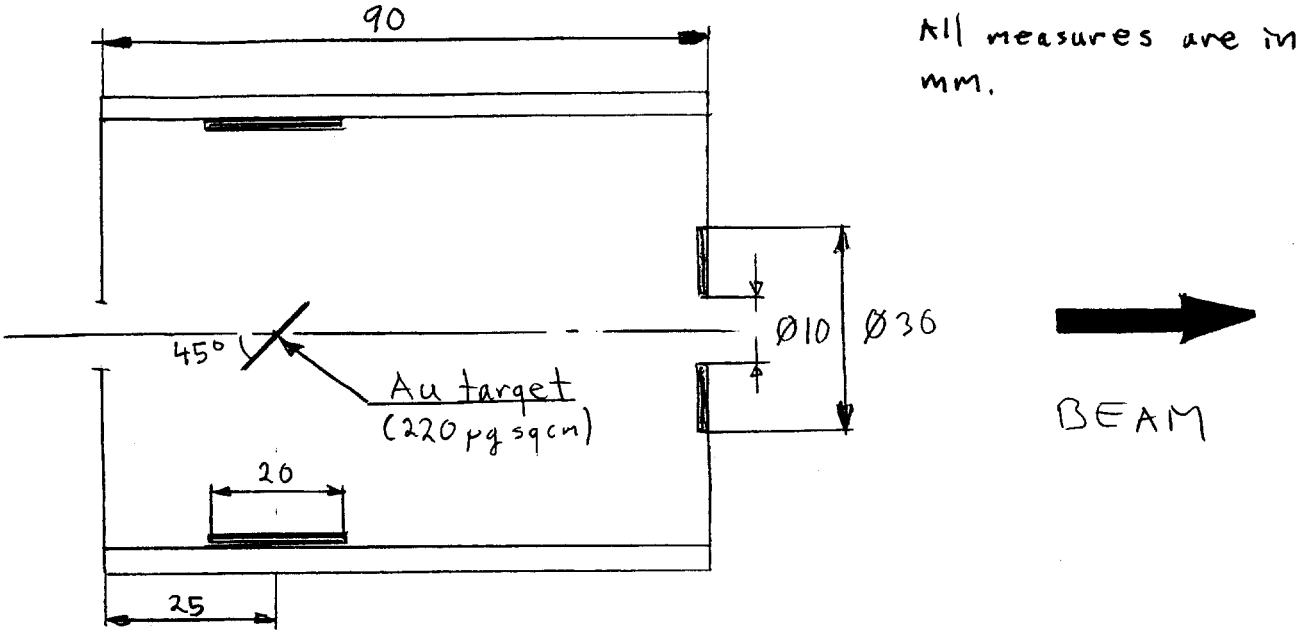
Experimental Setup

Chamber 1 (Angular Distribution)



Inside the chamber are 100 micron mylar catcher foils in backward and side directions and 125 micron mylar catcher foils in forward direction. The foils will be cut into nine angular intervals which are shown in the picture above. The parts which are shadowed by the target will not be counted.

Chamber 2 (Energy Spectra)



Inside the chamber are two stacks with mylar catcher foils, ranging from 0.294 mg cm^2 to 2.467 mg cm^2, in siderange directions, and one stack with mylar catcher foils, ranging from 0.284 mg cm^2 to 2.728 mg cm^2 in forward direction. By help of these mylar stacks it is possible to determine the energy of the fragments.