4.1 Introduction

Only a very small fraction ($\approx$ 1%) of the η''s that are produced can actually be detected by the equipment and fully reconstructed by the software. This fraction is commonly referred to as the detector acceptance and detailed understanding of its magnitude and dependence on measured quantities is essential for the determination of cross sections.

In all except the simplest high energy physics experiments, it is impossible to describe the detector acceptance analytically because of the complexity of the events under study, the detector equipment and the software used for event reconstruction and analysis. Most or all of the variables involved are correlated to an unknown extent.

Therefore numerical simulation methods have been developed to obtain acceptances. These Monte Carlo methods play an extremely important role in modern high energy physics experiments in all stages from conception of the experiment to final analysis. For this experiment the Monte Carlo studies can be subdivided in five categories:

1) Integration of the differential cross section and generation of simulated events.
2) Determination of the detectability of generated events: tracks of particles are followed through a model of the detector and the particles can interact with detector materials or decay.
3) Determination of the response of the detector components to the simulated particle trajectories: a detector component can measure properties of the particle to a certain accuracy, be inefficient in certain regions, or even be (partly) inoperational during a fraction of the data taking period.
4) Simulation of the trigger decision. Although closely related to 3) because the decision to trigger the detector on a given event is based on information from the same detector components, the complexity of the triggering process necessitates a separate treatment.
5) Analysis of the simulated data sample obtained.

In section 4.2 the Monte Carlo integration of the cross section and the event generation procedure will be described. Some characteristics of the generated events are discussed in section 4.3. Section 4.4 then gives a short description of the tracking through a model of the detector and section 4.5 treats the modeling of the response of the detector components. The trigger simulation procedure is outlined in section 4.6. Since there is no distinction between Monte Carlo events