8. Disscussion and Conclusion.

This paper emphasizes some of the factors and methods in developing, designing and servicing a pulse - discriminator using tunnel diodes.

The primary consideration is to study the behavior of a tunnel diode and how to determine its volt - ampere characteristic and how it is used as a circuit element in a pulse discriminator.

The second is to study, to analyze and to develop some types of pulse discriminator. During the experiment stress is given in the investigation of stability, linearity, sensitivity and also reliability.

The third is to apply it in nuclear radiation measurements. The pulse discriminator is then used as a level detector to discriminate unwanted signal (noises) in order that the output, signals are those corresponding solely to nuclear radiation and can be gated or further analyzed in nuclear pulse analyzer.

The results of the work can be concluded in the following lines:

8.1 The tunnel diode monostable circuit, though it is very simple with adjustable threshold level for low level unipolar pulse detection, the stability is the major problem because of its low current - low voltage characteristic. Further-more the switching time depends on the external components which are used to obtain the proper bias point. As a result it is hard to determine the transient characteristic of the switching action and it becomes difficult to predict the performance of the circuit for high frequency operation.

8.2 The bistable circuit is more stable than the monostable circuit be-cause it requires higher biasing voltage. Owing to its two stable stage operation, a bipolar input or an additional reset circuit is required. However the time required in switching depends largely on the tunnel diode itself so that we can determine the speed of switching easier than in the case of the monostable circuit.

However each discriminator circuit mentioned above has its own inherent advantages over the other. And it depends on the designer's choice to select the circuit that is most suitable for his work. For example, the differential pulse height discriminator shown in section 7 is used to develop a portable scaler which is intended to be used in field work under severe conditions influenced by high temperature and high humidity.