

## ABSTRACT

The main purpose of this research work was to observe and analyze the behavior of a piezoelectric sensor in the presence of high energy protons. The piezoelectric sensor was to be tested against the number of dose levels in order to understand the exact behavior of the sensor if it was to be used in the same level of proton radiation exposure at any other place. To carry out this research, a hardware setup was formed with the help of which a number of standard weights were used to exert pressure on the sensor. This was done in order to have exact pressure on the sensor before and after the radiations of protons. Proton radiations were bombarded on piezoelectric sensors with different dose levels while having constant energy and current for 1 minute, 2 minutes, 5 minutes, 10 minutes and 50 minutes durations. The results before and after radiations were compared and it was found that there was significant change in the characteristics of piezoelectric sensor. There was an increase in the voltage level, which was linear to the increase in the time of proton radiations. This was because the properties of quartz crystal were changed due to the bombardment of protons. Hence, it was concluded that the radiations of protons had a significant effect on the working of a piezoelectric sensor due to the changes developed in the quartz crystal after radiations. On the other hand, the linearity of all the sensors remained intact.