

Title: **Modeling of Seismic Waves for Earthquake Studies**

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Every year earthquakes cause massive destruction all over the world so there is a need to develop the models or systems which can help in predicting the upcoming earthquakes. The type of an earthquake depends on the region where it occurs and on the geological make-up of that region. The tectonic and volcanic types of earthquakes are most prominent in the Eastern Caribbean. The most destructive type of seismic waves is the surface wave, particularly Rayleigh wave due to their low frequency, long duration and large amplitude. The main aim of the present study is to create a model that attempts to describe the interactions between the seismic Rayleigh wave and the earth's surface. A review of essential information pertaining to earthquakes and seismic waves fundamentals has been done with focus on modeling the Rayleigh wave equation in a homogeneous and isotropic, elastic medium defined on a half space. Matlab has been used in the modeling of Rayleigh wave equation and its propagation along with the surface of the earth. Spectral analysis has also been carried out to describe the interactions between seismic waves and the earth's surface. Present study will be helpful in describing the behavior of these most tragic seismic waves and hence may be helpful in prediction of earthquakes.