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# EARTHQUAKE DETECTION AND DISASTER FORECASTING WITH UNIVERSITY CUBESATS

**Abstract**

Earthquakes are still considered as one of the most powerful devastating natural disasters in the world. Especially when there is an earthquake that has a greater scale then 6.0, the destruction can increase exponentially depending on the geographical conditions as well as on the civil structure at that particular area. Even if the earthquakes that has taken place in the 21st century is analyzed, it is seen that the death rate would be in the number of thousands and effected number of people in terms of injury and home displacement would be in the orders of tens of thousands. Thus the strategy will need to be threefold in dealing with this issue using space technology. This paper deals with these strategies using university made cubesats for earthquake detection, disaster mapping and disaster recovery assistance. There are several studies to suggest that before the beginning of a major seismic event, there are certain fluctuations in certain bands of the electromagnetic spectrum at the upper levels of the atmosphere. It is suggested to place university made cubesats at certain altitudes at Low Earth Orbit at different locations using highly elliptic orbits to cover potential earthquake prone areas. Using certain electromagnetic sensors which have been calibrated to work with certain electromagnetic frequencies, the electromagnetic wave fluctuations at various atmospheric altitudes can be analyzed 24/7 and potential seismic activities can be mapped with these electromagnetic disturbances and then analyzed to observe the correspondence between these two events. The analysis may lead to potential detection of earthquakes slightly before the earthquake happens which may be useful in disaster mitigation through an early warning system. Of course, the same cubesats can be equipped with high resolution cameras and IR cameras which can also be used for disaster mitigation and for coordinating search teams for the disaster prone areas making their functionality multifold. The paper will suggest that all of these operations can be done with minimum amount of budget using university funded cubesats.