

SYMPOSIUM ON INTEGRATED APPLICATIONS (B5)  
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DESIGN OF A TSUNAMI WARNING SYSTEM USING ELECTRON COUNT DATA FROM SMALL  
SATELLITE**Abstract**

One of the worst disasters in last 40 years took place on December 26, 2004. Sumatra Tsunami, result of the oceanic earth earthquake near Indonesian island killed over 200,000 people. This paper will suggest a method in which Tsunami can be predicted in order to reduce destruction in terms of lives. When Tsunami waves travel to the surface of ocean, the energy is transmitted to atmosphere through the air-water interface and propagates in the form of Internal Gravity Waves (IGW). The IGWs create perturbations in the atmosphere which cause significant change in Total Electron Count (TEC) at approximately 300 km altitude (Ionosphere). Measurement of TEC is one way which works on the principle of Faraday rotation method. In this method, satellite radiates two linearly polarized waves using monopole antennas. The angle of polarization and the intensities of the signals are measured at the ground station by using a crossed Yagi antenna. The ratio of these intensities will give the polarization angle. From the polarization angle, frequencies, magnetic field and position of satellite the TEC is estimated at ground station.

The main requirement to detect Tsunami is to have satellite above epicenter at the time of earth quake, communicating with the ground stations. Keeping this in mind, the IIT Bombay student satellite team (Pratham) had conducted a series of workshops regarding low cost ground station for various university students so that they can build their own ground station. The Pratham team has founded a society named Student Satellite Society of India which aims to bring together all the universities who have built or aim to build a student satellite. The society will give technical and non-technical support except funding to the new students who wish to enter this field to encourage a chain of satellites for successful implication of Tsunami pre-warning system.