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DESIGN OF DATA ACQUISITION, COLLECTION, PROCESSING AND ARCHIVING SYSTEM FOR
PRATHAM, IIT BOMBAY'S STUDENT SATELLITE PROJECT.**Abstract**

The Pratham IIT Bombay student satellite project aims to develop an ionospheric map of the world by using the method of Faraday rotation. The success of the mission depends upon the intensity of the ground based network collecting the data. Currently, around 15 universities across the nation and 1 international university are currently involved in the social goal. The National Atmospheric Research laboratory (NARL) has collaborated with the team and is willing to help in the post processing of the data. It has also agreed to be a part of the ground station network to collect data for Pratham. It is of vital importance that the groundstations follow a consistent protocol with respect to each other as to the method of data collection, storage and archiving for it to be of use to the scientific community. The paper highlights the importance of using off the shelf components while creating the data acquisition system. The data acquisition system consists of a set of antennae satisfying rigid conditions to maintain the required level of accuracy in the collected data. The acquisition chain is automated using off the shelf components. The acquired data has to be filtered without tampering with its fidelity. Maintaining fidelity is very important as the variation of ionosphere is otherwise very difficult to capture if the noise levels increase beyond a certain level. A complex set of filters including bandpass filters, notch filters, anti aliasing filters and digital filters are to be used to filter out the noise and preserve the fidelity of the signal. The collection of data is on the lines of the internationally recognised SEED format, which is used by seismologists all over the world to share data. The paper also describes the post processing of data which includes conversion of the measured intensities into polarization angles and further into tomographic maps. The data is in the IONEX format. There are 2 different formats, SEED and IONEX, for storage of raw and processed data. The data acquired by the other participating universities and NARL will be uploaded to the IITB server after post processing at their end. The archiving of data will be done on the Institut du Physics du Globe de Paris (IPGP) in France and Indian Institute of Technology Bombay servers. The data would be freely available and could be downloaded from www.aero.iitb.ac.in/pratham