M. S. Chitnis and P. C. Pandey, Extraction of voice pitch by measuring impedance variation across the thyroid cartilage, Proc. National Conference on Biomedical Engineering 1998 (NCBME 1998), Manipal, Karnataka, India, pp. II.10-12

Contact: Prof. P. C. Pandey
Department of Electrical Engineering,
Indian Institute of Technology Bombay, Powai, Mumbai.
mailto: pcpandey@ee.iitb.ac.in

Abstract - **Electroglottography is a non-invasive technique for measuring impedance variation across the thyroid cartilage of the larynx. This impedance variation provides information about the dynamics of the closure of vocal folds, and can be used for obtaining the voice pitch. We have developed a low-cost battery-operated instrument using this principle. A high frequency (300 kHz), low intensity (~3 mA) current is passed through the central discs (15 mm dia) of a pair of plate electrodes held in contact with the skin on both sides of the thyroid cartilage. A guard ring around each of the discs is actively driven to the same potential as the central disc, in order to minimize the superficial component of the sensing current. The impedance variations, cost by varying contact area between the vocal folds, result in amplitude modulated voltage waveform across the central disc electrodes. This waveform is demodulated to get the impedance variation. A low-cost microcontroller based signal acquisition, analysis, and LCD graphics display unit has been developed as a part of this instrument for displaying the impedance variation waveforms and pitch histograms for diagnosis of speech disorders.**