Design & Development of a Variable Electric Field Generator

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Certificate

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Dedication

We dedicate this dissertation to our lecturers/faculty members who have supported us throughout the process. We are also very thankful to our parents who gave us both the moral and financial support needed to achieve the milestone. We are also forever indebted to sir Majid Shehzad (Late) for being a great spiritual mentor.

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Abstract

Automation and the minimization of the hardware are the factors that are trending nowadays in order to increase the effectiveness and productivity of the system. Variable electric field has a large amount of applications nowadays. Ion Implementation makes use of the Electric Fields. Electric Fields are also used in Van De Graaff Generator. Food preservation methods also make use of the Electric Fields. Electric Fields are also used to measure cell and tissue properties. Our work presented here is based around the development of a variable electric field generator. This product is central to advanced industrial applications like contactless gripper, ion implantation and silicon chip. We have developed a system that is able to generate, control and monitor variable electric field. The developed system is capable of producing static as well as variable charges and can be implemented in any dynamic environment. The system also monitors and measures the field produced by the developed electric field generator. Initially we developed the mathematical model of our system. Afterwards, our developed model has been executed on simulation tools. After finalization of design parameters, hardware of the system has been developed. The developed hardware has the capability of generating variable Electric Field using solid state tesla coil. Sensor for field measurement has been incorporated by using National Instruments DAQ USB 6001. The same sensor provides feedback to controller which controls, monitors and updates the field according to the user's requirement.

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