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Design and construction of voltage measurement instrument (GVM) for 1.5 MV dynamitron accelerator

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Abstract

With the increasing use of particle accelerators in various fields, the construction of accelerators has developed. In these accelerators, measurement instruments that measure important and versatile quantities are very important. Due to the role of electric potential in particle acceleration, accurate measurement of electric potential at any time in accelerators is essential. In this research, design, fabrication and testing of a non-destructive electric potential measuring device called Generating Voltmeter (GVM) has been done. This instrument uses the principle of capacitance changes to measure voltage. Also, the effect of various parameters such as the number of rotor blades, stator thickness and diameter on the instrument performance has been investigated. Finally, a suitable GVM has been selected for use in the dynamitron electrostatic accelerator at the Nuclear Science and Technology Research Institute.

Keywords: dynamitron accelerator, high voltage, generating voltmeter, CST STUDIO SUITE 2015

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