

CHECKING THE POSSIBILITY TO IMPROVE ROGOWSKI COIL BY FINDING OPTIMAL PARAMETERS

Rathnasekara, K. M. C. J.^{1*}, Manathunga, C. H.¹ and Jayasinghe, C. M.²

1. Department of Physics, Faculty of Applied Sciences, University of Sri Jayewardenepura, Sri Lanka
 2. Ceylon Electricity Board
- **chathurajkonara@gmail.com*

Rogowski coil is a coil with an air core, which can be used to measure alternating currents or speed impulse currents in conductors by making a loop around current carrying conductor with the coil. Scientific base of this device is electromagnetic induction. Evolved from simple solenoids and have been in use since 1912. Mechanism of this device can be explained with Ampere's law and Faraday's law. In early days people couldn't use this device for measuring current effectively due to the low voltage output. But with the sensitivity of today's measuring equipment it has been able to use this device in number of current monitoring applications. Since this device does not have a ferromagnetic core, it can measure high amplitude currents without saturation. Relationship between current in Rogowski coil (the secondary coil) and current in current carrying wire (the primary coil) is liner. This gives coil the ability to measure current from mili-amperes to mega-amperes. Measurements of Rogowski coil are not as accurate as regular ammeter measurements. In this research it is explained how to optimize the output of Rogowski coil from making the electromagnetic induction more efficient by using most suitable parameters for Rogowski coil. A brief review on mechanism and scientific base of Rogowski coil has been provided. Output currents from Rogowski coil were measured while changing number of windings and gauge (diameter) of Rogowski coil. According to the results, increasing the number of windings and decreasing the gauge of coil (increasing thickness of coil) has a positive effect on inducing current from current carrying conductor to Rogowski coil. But increasing the number of windings, reduce the value of maximum frequency of current waves that can be measured with Rogowski coil since inductive reactance and capacitive reactance increase with number of windings.

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