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## DETERMINATION OF THE CAPACITANCE PER UNIT LENGTH CYLINDRICAL CONDUCTOR LINE IN GROOVE

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### Abstract

This paper presents an application of Charge Simulation Method for calculation of the capacitance per unit length, cylindrical conductor line in the U - shaped groove. Results obtained by this method are compared with results obtained with approximate expression given in [1]. Convergence of the results for the normalized capacitance per unit length are shown. The results are presented in tabular and graphical form. <sup>1</sup>

Keywords and phrases: *Charge Simulation Method, Cylindrical Conductor, Groove*

## 1 Introduction

One of the most important and also the most difficult steps in the design process of electromagnetic devices is the assessment of electromagnetic processes which are occurring in them. Conductors are widely used in various fields of electrical engineering. Electrical parameters of conductor have affect to the distribution of current, voltage and charge on the conductor, so it is very important to know their values. Conductors which are located in grooves (diamagnetic, paramagnetic or ferromagnetic) are widely used in various fields of electrical engineering. From the standpoint of science and practice it is very interesting behavior of the conductor in the groove. It is usually considered cylindrical conductors with different cross-section (circular, rectangular, polygonal, etc.) in a homogeneous electric field, Fig. 1. Of interest is to determine the electric field and the potential of these systems, and the important parameters such as capacitance and conductance.

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