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**LIGHTNING ATTACHMENT TO POWER TRANSMISSION LINES  
-ON THE VALIDITY OF THE ELECTROGEOMETRIC MODEL-**

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**Abstract** - The electrogeometric method (EGM) has been widely used for the design of the optimum location of shielding ground conductors to properly protect phase conductors in power transmission lines. It assumes that the lightning attractiveness of any grounded structure can be expressed through an analytical expression which is a function of the return stroke peak current. However, this expression grossly oversimplifies the physical nature of the lightning discharge and does not take into account the effect of the height of the structure. In this paper, an up-to-date leader inception and propagation model based on the physics of discharges is used to evaluate the validity of the assumptions of the EGM. Furthermore, the results obtained with the physics-based model are compared with the predictions of the electrogeometric model for a UHV transmission line to evaluate the limitations of the EGM. Thus, the validity of the electrogeometric method for the evaluation of effective shielding of transmission power lines is discussed.