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ANALYSIS OF PARAMETRIC UNCERTAINTY LINKED TO BEHAVIOR OF FATIGUE OF ELECTRICITY TRANSMISSION CABLES

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Abstract. The electric transmission overhead lines are subject to the action of the wind, which causes a transverse vibration of the conductor and, therefore, alternating stress. The complex mechanism of interaction between the strands of an electric conductor subjected to alternating bending has made it difficult to calculate the real efforts. The distribution of stresses in the conductor during the alternating movement is affected by numerous direct factors related to its structure (conductor diameter, flexural stiffness, length, number of wires and layers) and indirect (types of clamps used, distributions of pressure inside the conductor generated in the mounting of the clamp). Another important factor is the contact tension between the strands of the conductor. At present, there are standards and guidelines for conducting laboratory tests where it is possible to simulate the conditions presented in the field, so that information on these parameters can be obtained, thus facilitating the study of their dynamic behavior and the relationship with the efforts presented. In this paper, a stochastic finite element model is introduced with the objective of contrasting the results obtained from using the Poffenberger Swart expression, widely used in the design and maintenance of electric transmission lines, taking as input data the measurements laboratory, of the displacement of the conductor at a defined distance from the suspension clamp.