

Multiphysical Simulation of Moved Data Cable

M. Raum¹

¹Friedrich-Alexander Universität, Erlangen, BY, Germany

Abstract

In general this thesis is about the effects of mechanical stress on data cables in moved applications. If a data cable is loaded with different kind of forces and used within high frequency applications it is possible, that the geometrical changes may have an impact on the electrical parameters of the cable. These influences are analyzed supported by COMSOL Multiphysics®. Therefore a model is defined in COMSOL Multiphysics® consisting of one cylinder for the jacket and two cylinder for the conductors. The structural mechanics module of COMSOL Multiphysics® is used to define the different load types. The static electric, magnetic fields and magnetic and electric fields modules are used to calculate the electric and magnetic parameters of a data cable. In addition these interfaces are combined to an magnetic- and electric-mechanic study step to analyses the effects of the mechanical stress.

In conclusion in some situations the mechanical stress effects the data cables in an expected way, backed by theoretical equations. In other situations with the support of COMSOL Multiphysics®, some odd results could be found and be explained.

Figures used in the abstract

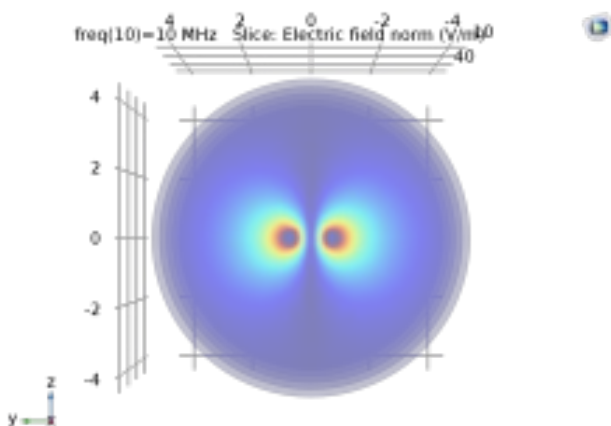


Figure 1: Cross section of the data cable with electric field.