Elastic guided wave propagation in electrical cables

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Abstract— **This article analyzes the propagation modes of ultrasound waves inside an electrical cable in order to assess its behavior as an acoustic transmission channel. A theoretical model for propagation of elastic waves in electric power cables is presented. The power cables are represented as viscoelastic-layered cylindrical structures with a copper core and a dielectric cover. The model equations then have been applied and numerically resolved for this and other known structures such as solid and hollow cylinders. The results are compared with available data from other models. Several experimental measures were carried out and were compared with results from the numerical simulations. Experimental and simulated results showed a significant difference between elastic wave attenuation inside standard versus bare, low-voltage power cables.**

Index Terms—

Citation: