SUMMARY

At present, different methods for magnetostatic force densities in a continuous medium are used. Some of them are based on models of interaction of matter with an external field and others are derived from Maxwell’s tensors in matter. All of these densities are different. Current models of magnetomechanical interactions are conditioned by the choice of one of these densities. In this dissertation a new model of magnetomechanical interaction that is independent on force density adopted is proposed. The Cauchy stress tensor obtained is constituted by the addition of three components: elastic, magnetic and magnetoelastic tensors. The magnetic component is the only one dependent on force density adopted. It is found that the magnetoelastic Cauchy stress tensor is not in general symmetric and an extended magnetostatic force density that takes into account the effects of elastic interaction is defined.

KEY WORDS: Magnetoelastic coupling, Maxwell’ tensor in matter, Cauchy stress tensor.