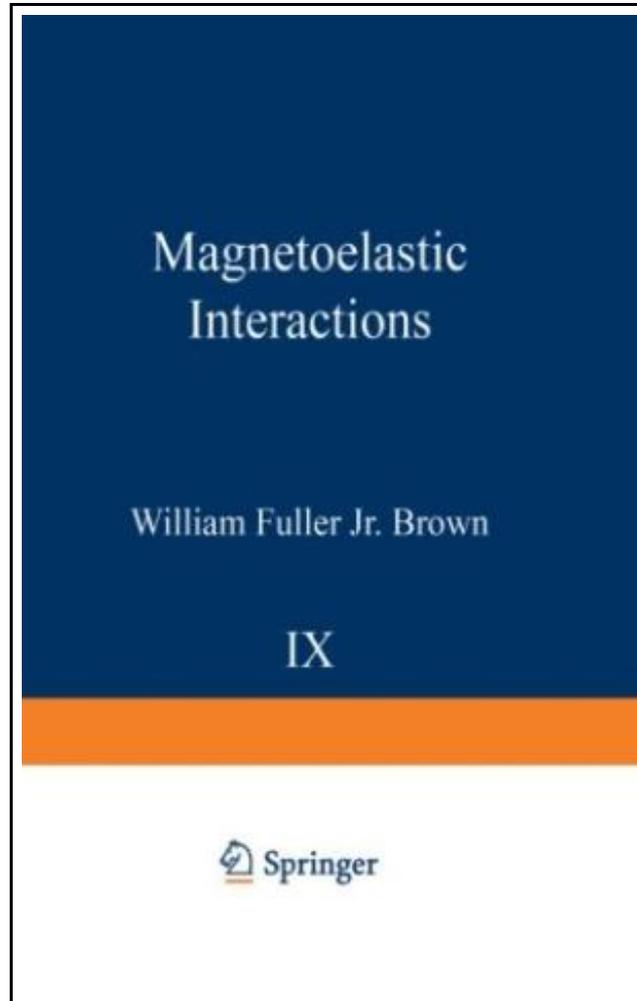


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(Prof. Maya Hand)

MAGNETOELASTIC INTERACTIONS



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Book Condition: New. Publisher/Verlag: Springer, Berlin | The modern theory of ferromagnetic magnetization processes has from the beginning recognized the importance of magnetoelastic interactions. Most of the magnetoelastic calculations, however, have been based on the theory developed by R. BECKER and others in the early 1930's. That theory has several defects; how to remedy them is the subject of this monograph. I first became aware of the shortcomings of the traditional theory thru a critical study of electric and magnetic forces, which I undertook as a member of the COULOMB'S Law Committee of the American Association of Physics Teachers. My conclusions were published in 1951 in the American Journal of Physics; an application of them to a problem in magnetostriction was published in 1953 in Reviews of Modern Physics. With the development, in 1956, of the "nucleation field" theory of micromagnetics, the need for a systematic and self-consistent theory of magnetoelastic interactions became more pressing. The traditional theory predicted that the nucleation field should differ negligibly from that of a rigid body; but my 1953 magnetostriction calculation suggested that terms omitted in that theory might be important. In the academic year 1963/64, I was finally able - thanks to a sabbatical furlough - to find the time needed for systematic development of a basic theory of magnetoelastic interactions in a ferromagnet. | I Fundamental Concepts and Definitions.- 1. Introduction.- 1.1. Statement of the problem.- 1.2. The conventional theory of magnetostriction.- 1.3. The rigorous formal theory.- 1.4. The aim of this treatment.- 1.5. Units and notation.- 2. Magnetostatic Fundamentals.- 2.1. Methods of approach; poles and currents.- 2.2. Current-current forces.- 2.3. Magnetized bodies.- 2.4. The field vectors B and H.- 2.5. The force and torque on a complete body.- 2.6. Energy relations for a rigid magnetic body.- 2.7. Ferromagnetic materials.- 3....



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