Statistical Energy Analysis

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This book is a revision of Statistical Energy Analysis of Dynamical Systems which was originally written by Richard H. Lyon. The book begins with a description of the origins of statistical energy analysis (SEA), and then presents an analysis of vibrating systems in terms of energy. The analysis continues with a description of how energy is shared in coupled systems, and how, at relatively high modal densities, the modal response statistics of systems can be calculated. These topics make up Part I of the text. Part II of the text is devoted to engineering applications. Although the procedures are based on the theoretical material in Part I, the material is intended to be understandable without a detailed understanding of the theoretical background. Topics covered in Part II include such topics as how to set up a model of a dynamical system, and evaluation of the mode count, damping loss factors, and coupling loss factors.

There are chapters on evaluation of input power to the system, solving for the energy distribution and evaluating the dynamical response variables. There is also a brief discussion of transient SEA and an example of the application of SEA to a welded steel plate structure.