



# Foundation of Statistical Energy Analysis in Vibroacoustics

By A. Le Bot

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This book provides an in-depth study of the foundations of statistical energy analysis, with a focus on examining the statistical theory of sound and vibration. In the modal approach, an introduction to random vibration with application to complex systems having a large number of modes is provided. For the wave approach, the phenomena of propagation, group speed, and energy transport are extensively discussed. Particular emphasis is given to the emergence of the diffuse field, the central concept of the theory. All important notions are gradually introduced---making the text self-contained---to lead the reader to the ultimate result of 'coupling power proportionality' and the concept of 'vibrational temperature'. Further key topics include the analogy between thermodynamics and sound vibration. Applications are concerned with random vibration in mass--spring resonators, strings, beams, rods, and plates but also reverberation in room acoustics, radiation of sound, and sound response.

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Review

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### About the Author

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Graduated in both engineering and mathematics, Alain Le Bot started his career as teacher in mathematics in Institut National Polytechnique Felix Houphouet Boigny, Ivory Coast. Being back in France, he joined EDF as engineer in acoustics. Doctor in acoustics in 1994, he is currently Director of Research at CNRS in the Laboratory of Tribology and Dynamics of Systems and teaches in Ecole centrale de Lyon. His main areas of research concern acoustics, vibration, and tribology.

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