Aerodynamic Noise: An Introduction for Physicists and Engineers
Tarit Bose
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When I first perused Dr. Bose's latest publication, I was immediately reminded of Rayleigh's *Theory of Sound* with its mix of mathematical derivations and scientific reviews delivered with a smattering of colloquialisms — an interesting observation it turns out, since Bose refers to Rayleigh several times in the book.

Dr. Bose has recently retired and is busy converting his lecture notes into textbooks. Professor Bose was a faculty member of the Department of Aerospace Engineering at the Indian Institute of Technology, Madras, India from 1970 to 1998. Last year he published *Airbreathing Propulsion*, this year's publication is *Aerodynamic Noise* and next year's treat will be on Tipu Sultan's Rockets.

Aerodynamic Noise is a seven step introductory textbook on numerical aero-acoustics. Those steps are 1) develop the wave equation for a linear, non-viscous fluid from the continuity and momentum equations; 2) develop the equations of elemental radiation patterns (monopole, dipole, quadrupole); 3) develop Lighthill's analogy of sound by assigning terms in the Navier–Stokes equations to elemental radiation patterns; 4) solutions to Lighthill's equation; 5) introduce convection terms; 6) review the computer numerical methods available to solve problems; and 7) introduce advanced topics.

Aerodynamic Noise is a good course book and is also a useful reference for anyone wanting to quickly get up to speed on numerical aeroacoustics. It could be used at the senior undergraduate or graduate level of study.

Maybe because the book evolved from a set of class lecture notes (and maybe because I struggled through boundary layer theory), the reader may feel as though something is missing. Subjects are introduced without revealing their significance to the overall scheme of the derivation. If delivered in a classroom setting, someone would have raised their hand. Each chapter concludes with review exercises but there are no worked out examples. In a classroom setting, there is feedback on each quiz.

I give high marks for any book that has a list of symbols, and *Aerodynamic Noise* has three pages included in the back of the book; however, not every equation complies with or is represented in the list. Some of the computer-generated illustrations appear to be have been made at the dawn of computer graphics and deserve to be upgraded for such a good text.

There are a few sections of the book which, although I found interesting, added little to the book's purpose. A full 2-1/2 pages of the introduction is devoted to the history of musical pitch standards and is not referred to again. The section on propeller noise includes several non-technical paragraphs on the Dyson fan. The reader will also find a few editing mistakes and omissions throughout the book but nothing that is not obvious.

All things considered, *Aerodynamic Noise* is a good textbook for teaching a course and an OK reference for non-academic settings. You can preview *Aerodynamic Noise* on Springer's website www.springer.com and can also purchase a watermarked PDF or a hardcover copy.

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