Computational Aeroacoustics: Overview and Numerical Methods

Tim Colonius
California Institute of Technology
Pasadena, CA 91125 USA
colonius@caltech.edu

Contents

Abstract

In these lecture notes, we discuss the goals of computational aeroacoustics (CAA) and the numerical techniques that have been developed to achieve them. We first survey the scientific and engineering issues that have motivated computational approaches to aeroacoustic problems over the past few decades, and define choices of flow model and numerical algorithms that are appropriate to the differing goals and applications. Next we examine numerical algorithms for computation of aerodynamic sound in detail, with the aim of acquainting the student with ssues that drive the design of algorithms. In order to keep these notes as brief as possible, no attempt is made to survey the extensive literature on CAA. The student may consult recent reviews of CAA [1, 2] for a more complete summary of the field and complete references to the archival literature.