

## **ACOUSTICS2008/1750 Modeling and Prediction of Fan Noise**

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Fan noise is a significant contributor to the total noise signature of a modern high bypass ratio aircraft engine and, with the advent of ultra high bypass ratio engines like the geared turbofan, it is likely to remain so in the future. As such, accurate modeling and prediction of the basic characteristics of fan noise are necessary ingredients in designing quieter aircraft engines in order to ensure compliance with ever more stringent aviation noise regulations.

In this paper, results from a comprehensive study aimed at establishing the utility of current tools for modeling and predicting fan noise will be summarized. It should be emphasized that these tools exemplify present state of the practice and embody what is currently used at NASA and industry for predicting fan noise. The ability of these tools to model and predict fan noise is assessed against a set of benchmark fan noise databases obtained for a range of representative fan cycles and operating conditions. Detailed comparisons between the predicted and measured narrowband spectral and directivity characteristics of fan noise will be presented in the full paper. General conclusions regarding the utility of current tools and recommendations for future improvements will also be given.