

## **ACOUSTICS2008/97 Airframe noise prediction**

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This presentation discusses the prediction of aircraft airframe noise, namely, the noise that is generated by non-propulsion components of aircraft, including the leading edge slats, the side edges of flaps and the landing gears. An overview will be given on various methodologies, ranging from empirical prediction to more physics-based modeling to full-blown numerical simulation. The advantages of each method will be discussed and compared with each other to reveal the most suitable application domain of each method. Detailed discussions will be given to the physics-based modeling, such as the acoustic analogy, which is ranked in between empirical and numerical methods in various aspects, including accuracy, turn-around time, limitations on geometry and flow conditions, and applicability/ feasibility in practical design applications. Examples will be given to demonstrate the applications of acoustic analogy in both noise prediction and noise reduction treatment design. Critical elements of the method that can and need to be improved to further mature the method will also be identified and discussed, providing potential directions for future research and development.