

ACOUSTICS2008/2254 Trailing edge noise computation of a fan blade profile

Julien Christophe^a, Jerome Anthoine^a and Stéphane Moreau^b

^avon Karman Institute, Chausee de Waterloo, 72, 1640 Rhode-Saint-Genese, Belgium

^bValeo Thermal Systems, rue Louis Normand, 8, 78321 La Verrière, France

In problem involving noise generated by fans or high-lift devices in uniform stationary flow, trailing edge noise has a primary interest. This paper proposes to study the trailing edge noise produced by a Controlled-Diffusion (CD) airfoil specially developed for automotive engine cooling by Valeo. A LES flow computation is realised through the Fluent solver 6.3 for a Reynolds number based on the chord of 1.5×10^5 and an angle of attack of 8 degrees. This computation is compared to pressure and velocity measurements performed at ECL (France) and obtained by measurement techniques involving pressure probes and hot-wire anemometry. Amiet's theory using surface pressure spectra around the airfoil trailing-edge region is used to obtain far field acoustic predictions that are compared to microphone measurements.