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### **Experimental investigation of wind turbine noise**

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Broadband noise is nowadays the major contribution to the total spectrum of noise generated by wind turbines. The mechanisms that generate airfoil self-noise have been studied through years and many authors agree that dominant noise comes from inflow turbulence, and interaction between turbulent boundary layer and trailing edge of the airfoil. This study presents results from combined experimental techniques in order to better identify and predict noise issuing from a NACA 0012. Noise from trailing edge is most investigated in a 2D configuration in an anechoic wind tunnel, using microphone array (far field measurements), wall pressure fluctuations, hot wire. The data base turns out to be useful in order to improve extensions of Amiet and Brooks models. Some aspects of noise mechanisms and their characteristics are better identified and refined when wind tunnel results are compared to measurements of noise on full scale wind turbines. Measurements in situ achieved with a microphone array of 30 meters wide are used to provide complementary informations on 3D rotating source in terms of localisation and specific directivity.