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**Methodological and metrological benchmarks for determining
experimental values of meteorological parameters**

Benoit Gauvreau

Laboratoire Central des Ponts et Chaussées, Centre de Nantes - Route de Bouaye, BP 4129, 44341
Bouguenais cedex, France

Outdoor sound propagation is largely influenced by meteorological conditions : mean refraction, intermittency and atmospheric turbulence. Thus, acoustic engineers and scientists have to rigorously characterize those propagation conditions through several parameters, both for numerical predictions (input data) and for operational reports (impact studies). One of these influent parameters is the well-known (and widely used) effective vertical sound speed gradient, which depends on spatial and temporal mean values of wind and temperature between source and receiver.

However, the experimental characterization of wind and temperature (and next sound speed) vertical profiles remains delicate : it requires accurate meteorological devices and adapted measuring methods. At this purpose, an experimental campaign has been carried in 2007 on a perfectly flat and open ground, in order to quantify the confidence, uncertainty and spreading of such parameter values for different time scales. This campaign involved different meteorological devices : instrumented towers, classical sensors, 3D sonic anemometers, etc.

The benchmark results will be presented and next analysed in terms of metrological and methodological requirements for acousticians in charge of environmental studies for standard organizations and/or scientific institutes.