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**Free-field calibration of microphones: theoretical and experimental
determination of the acoustic center**

Dominique Rodrigues^a, Jean-Noel Durocher^a, Michel Bruneau^b and Anne-Marie Bruneau^c

^aLaboratoire Nationale de métrologie et d'Essais (LNE), 29 avenue Roger Hennequin, 78197 Trappes Cedex,
France

^bLaboratoire d'Acoustique de l'Université du Maine, Avenue Olivier Messiaen, 72085 Le Mans, France

^cLaboratoire d'Acoustique de l'Université du Maine (LAUM, UMR CNRS 6613), Avenue Olivier Messiaen,
72085 Le Mans, France

The concept of acoustic center is closely linked to the free-field calibration of microphones and have a great influence on the final results for the free-field sensitivity of the calibrated microphones. The international standard IEC 1094-3 defines the acoustic center of a reciprocal transducer as the point from which spherical waves seem to be diverging when the transducer is acting as a source. In the literature, the principal procedure used to measure the acoustic center of a reciprocal transducer is based on the measurement of the modulus of electrical transfer impedance at various distances of three pairs of microphones coupled by a free field. This paper presents a new procedure to determine the acoustic center of a reciprocal transducer assuming a source without any acoustic center and measuring the modulus of the electrical transfer impedance at various distances between this source and the transducer to be tested. Finally, the position of the acoustic center is deduced from the inverse distance law. Experimental values are presented and compared with theoretical values obtained using a theoretical model of the laboratory standard microphones (mounted on a semi-infinite rod) derived from those available in the literature.