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**Improvements on the directional characteristics of a calibration**  
**sound source using the Boundary Element Method**

Vicente Cutanda Henriquez<sup>a</sup>, Salvador Barrera-Figueroa<sup>b</sup> and Peter Juhl<sup>a</sup>

<sup>a</sup>Institute of Sensors, Signals and Electrotechnics, University of Southern Denmark, Niels Bohrs Allé 1, 5230 Odense S, Denmark

<sup>b</sup>Danish Fundamental Metrology, Matematiktorvet 307, 2800 Kgs. Lyngby, Denmark

The project Euromet-792 aims to investigate and improve methods for secondary free-field calibration of microphones. In this framework, the comparison method is being studied at DFM in relation to the more usual substitution method of microphone calibration. The design of the sound source is of particular importance to achieve a sound field that reaches both microphones with the same level and that is sufficiently uniform at the microphone positions, in order to reduce the effect of misalignment. An existing sound source has been modeled using the Boundary Element Method, and the simulations have been used to modify the source and make it suitable for this kind of calibration. It has been found that a central plug, already present in the device, can be re-shaped in such a way that makes the sound field on the microphone positions more uniform, even at rather high frequencies. Measurements have been carried out in order to verify the goodness of this solution.