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Towards 'not so spherical' microphone arrays

Nicolas Epain and Jérôme Daniel
France Telecom R&D, 2 avenue Pierre Marzin, 22300 Lannion, France

An increasing number of applications require that the sound field spatial properties are accurately described. Using arrays consisting of omnidirectional microphones distributed at the surface of a rigid sphere has been proven to be an efficient yet practical strategy to obtain such three dimensional sound field descriptions. However these sensor arrays are known to suffer from frequency limitations, mainly due to the sphere directivity properties. In this paper, it is proposed to optimize the shape of the object upon which the microphones are located, in order to make them more directive. Results of measurements and simulations show that such "not so spherical" shapes could help at widening the microphone array frequency range.