Radiation impedance of condenser microphones and their diffuse-field responses.

The relation between the diffuse-field response and the radiation impedance of a microphone has been investigated. Such a relation can be derived from classical theory. The practical measurement of the radiation impedance requires (a) measuring the volume velocity of the membrane of the microphone and (b) measuring the pressure on the membrane of the microphone. The first measurement is carried out by means of laser vibrometry. The second measurement cannot be implemented in practice. However, the pressure on the membrane can be calculated numerically by means of the boundary element method. In this way, a hybrid estimate of the radiation impedance is obtained. The resulting estimate of the diffuse-field response is compared with experimental estimates of the diffuse-field response determined using reciprocity and the random-incidence method. The different estimates are in good agreement at frequencies below the resonance frequency of the microphone. Although the method may not be of great practical utility, it provides a useful validation of the estimates obtained by other means.

General information
State: Published
Organisations: Acoustic Technology, Department of Electrical Engineering
Contributors: Barrera Figueroa, S., Rasmussen, K., Jacobsen, F.
Pages: 2290-2294
Publication date: 2010
Peer-reviewed: Yes

Publication information
Volume: 127
Issue number: 4
ISSN (Print): 0001-4966
Ratings:
BFI (2019): BFI-level 2
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 1.77 SJR 0.695 SNIP 1.224
Web of Science (2017): Impact factor 1.605
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 1.83 SJR 0.819 SNIP 1.271
Web of Science (2016): Impact factor 1.547
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 1.77 SJR 0.854 SNIP 1.416
Web of Science (2015): Impact factor 1.572
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 1.8 SJR 0.887 SNIP 1.402
Web of Science (2014): Impact factor 1.503
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 2 SJR 0.707 SNIP 1.937
Web of Science (2013): Impact factor 1.555
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 1.75 SJR 0.771 SNIP 1.619
Web of Science (2012): Impact factor 1.646
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes