

Analytic methods of sound field synthesis

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Abstrak

This book puts the focus on serving human listeners in the sound field synthesis although the approach can be also exploited in other applications such as underwater acoustics or ultrasonics. The author derives a fundamental formulation based on standard integral equations and the single-layer potential approach is identified as a useful tool in order to derive a general solution. He also proposes extensions to the single-layer potential approach which allow for a derivation of explicit solutions for circular, planar, and linear distributions of secondary sources. Based on above described formulation it is shown that the two established analytical approaches of Wave Field Synthesis and Near-field Compensated Higher Order Ambisonics constitute specific solutions to the general problem which are covered by the single-layer potential solution and its extensions.