

Spatial Hearing

The Psychophysics
of Human Sound Localization

Revised Edition

Jens Blauert



Spatial Hearing
The Psychophysics of
Human Sound Localization

Jens Blauert (1997)

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2nd, enlarged edition 1997

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Spatial Hearing -- The Psychophysics of Human Sound Localization: Contents

1 Introduction

- 1.1 Auditory Events and Auditory Space
- 1.2 Systems Analysis of the Auditory Experiment
- 1.3 Remarks Concerning Experimental Procedures
(Psychometric methods; signals and sound fields; probe microphones)

2 Spatial Hearing with One Sound Source

- 2.1 Localization and Localization Blur
- 2.2 The Sound Field at the Two Ears
(Propagation in the ear canal; the pinna and the effect of the head; transfer functions of the external ear)
- 2.3 Evaluating Identical Ear Input Signals
(Directional hearing in the median plane; distance hearing and inside-the-head locatedness)
- 2.4 Evaluating Nonidentical Ear Input Signals
(Interaural time differences; interaural level differences; the interaction of interaural time and level differences)
- 2.5 Additional Parameters
(Motional theories; bone-conduction, visual, vestibular, and tactile theories)

3 Spatial Hearing with Multiple Sound Sources and in Enclosed Spaces

- 3.1 Two Sound Sources Radiating Coherent Signals
(Summing localization; the law of the first wavefront; inhibition of the primary sound)
- 3.2 Two Sound Sources Radiating Partially Coherent or Incoherent Signals
(The influence of the degree of coherence; binaural signal detection)

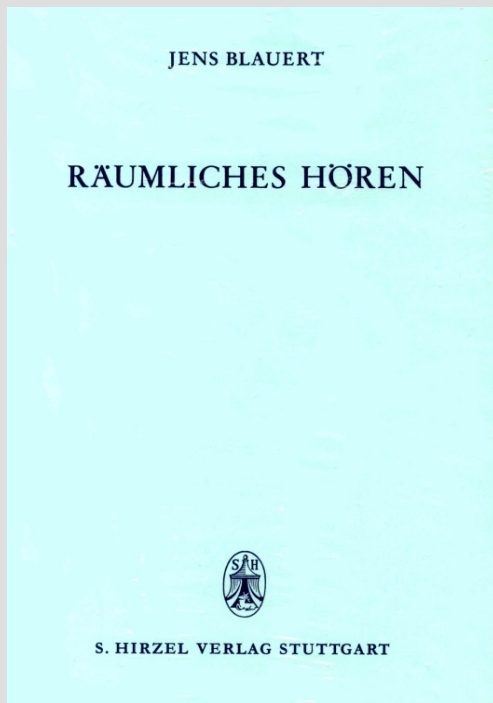
- 3.3 More than Two Sound Sources and Diffuse Sound Fields

4 Progress and Trends since 1972

- 4.1 Preliminary Remarks
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- 4.4 Evaluation of Interaural Attributes of the Ear Input Signals
(Lateralization and multiple auditory events; summing localization and the law of the first wavefront; binaural localization, signal detection, and speech recognition in the presence of interfering noise; models of binaural signal processing)
- 4.5 Examples of Applications
(The auditory spatial impression; dummy-head stereophony)

5 Progress and Trends since 1982

- 5.1 Preliminary Remarks
- 5.2 Binaural Room Simulation and Auditory Virtual Reality
- 5.3 Binaural Signal Processing and Speech Enhancement
- 5.4 The Precedence Effect: A Case of Cognition



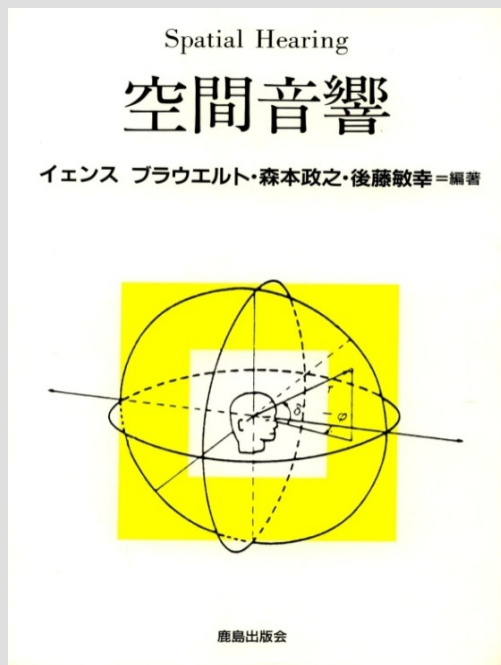
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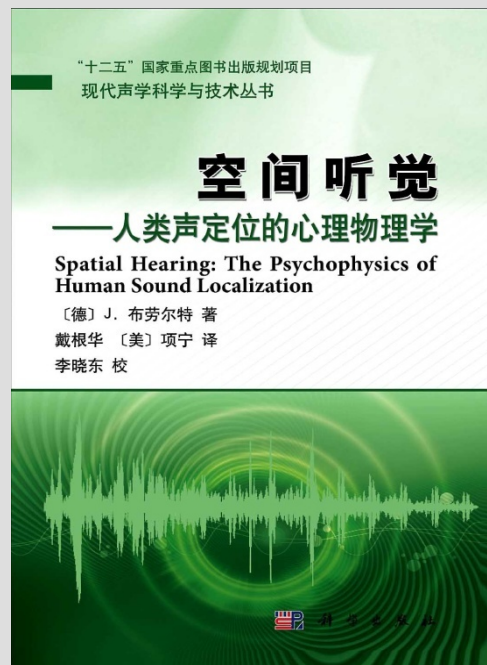
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(c)



(d)



(e)

(a), (b) Spatial Hearing
(German) 1974, 2013

(c) Spatial Hearing (Russian)
1979

(d) Spatial Hearing
(Japanese) 1986
with M. Morimoto
and T. Gotoh

(e) Spatial Hearing
(Chinese) 2013

Räumliches Hören

Dieses E-Book enthält das Grundwerk nebst zweier Ergänzungen und Zusatzmaterialien in deutscher Sprache. Die englischsprachige Ausgabe „Spatial Hearing—The Psychophysics of Human Sound Localization“ ist 1997 in zweiter, erweiterter Auflage bei MIT-Press, Cambridge, Massachusetts erschienen.

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J. Blauert (Ed.)

Communication Acoustics

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Authors: *Jens Blauert, Jonas Braasch,
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- (a) Communication Acoustics
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- (b) Speech Technology (German)
with E. Schaffert 1985

Jens Blauert
Ning Xiang

Blauert · Xiang



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Troy Lectures
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Acoustics for Engineers

2nd Ed.

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Jens Blauert & Ning Xiang

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7. **The wave equation in fluids**
8. **Horns and stepped ducts**
9. **Spherical sound sources and line arrays**
10. **Piston membranes, diffraction and scattering**
11. **Dissipation, reflection and absorption**
12. **Geometric acoustics and diffuse sound fields**
13. **Isolation of air- and structure-borne sound**
14. **Noise control: a survey**

**Appendices, incl. complex notation for sinusoidal signals,
and for power and intensity, and a selection of problems**

Modern Acoustics and Signal Processing

Jens Blauert *Editor*

The Technology of Binaural Listening

This book reports on the application of advanced models of the human binaural hearing system in modern technology, among others, in the following areas: binaural analysis of aural scenes, binaural de-reverberation, binaural quality assessment of audio channels, loudspeakers and performance spaces, binaural perceptual coding, binaural processing in hearing aids and cochlea implants, binaural systems in robots, binaural/tactile human-machine interfaces, speech-intelligibility prediction in rooms and/or multi-speaker scenarios. An introduction to binaural modeling and an outlook to the future are provided. Further, the book features a MATLAB toolbox to enable readers to construct their own dedicated binaural models on demand.

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Modern Acoustics and Signal Processing


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The Technology of Binaural Listening

The Technology of Binaural Listening



 Modern Acoustics and Signal Processing

 Springer

THE TECHNOLOGY OF BINAURAL LISTENING

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- Chap9* **Binaural systems in robotics**
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- Chap11* **Optimization of binaural algorithms for maximum predicted speech intelligibility**
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- Chap12* **Modeling sound localization with cochlear implants**
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- Chap13* **Binaural assessment of parametrically coded spatial audio signals**
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- Chap14* **Binaural dereverberation**
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- Chap15* **Binaural localization and detection of speakers in complex acoustic scenes**
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- Chap16* **Predicting binaural speech intelligibility in architectural acoustics**
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- Chap17* **Employing binaural–proprioceptive interaction in human-machine interfaces**
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- Chap18* **Further challenges and the road ahead**
J. Blauert, D. Kolossa, K. Obermayer, and K. Adiloglu

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Jens Blauert
Jonas Braasch *Editors*

The Technology of Binaural Understanding

2020



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Benjamin Cohen-Lhyver, Sylvain Argentieri and Bruno Gas

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