

Spatial Hearing

The Psychophysics
of Human Sound Localization

Revised Edition

Jens Blauert



Spatial Hearing
The Psychophysics of
Human Sound Localization

Jens Blauert (1997)

1st edition 1983
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)

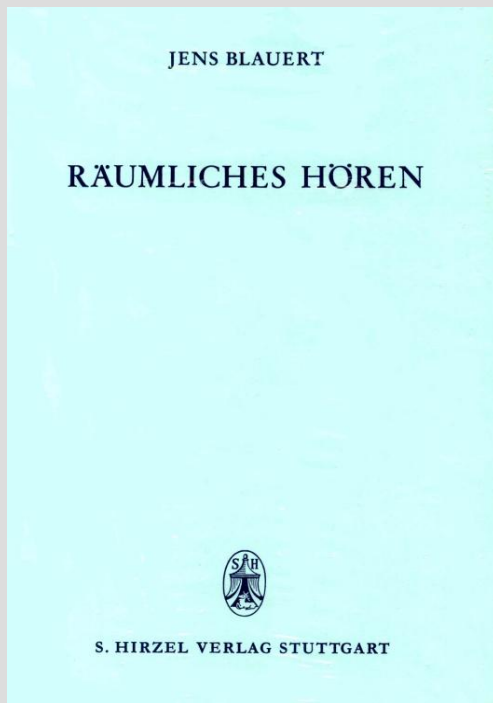
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4 Progress and Trends since 1972

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(Transfer functions of the external ear; area function and termination of the ear canal; analysis of transfer characteristics)
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(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)
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(The auditory spatial impression; dummy-head stereophony)

5 Progress and Trends since 1982

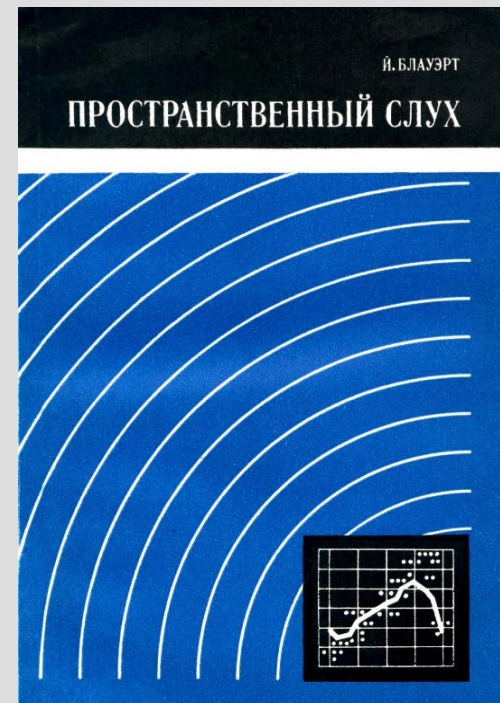
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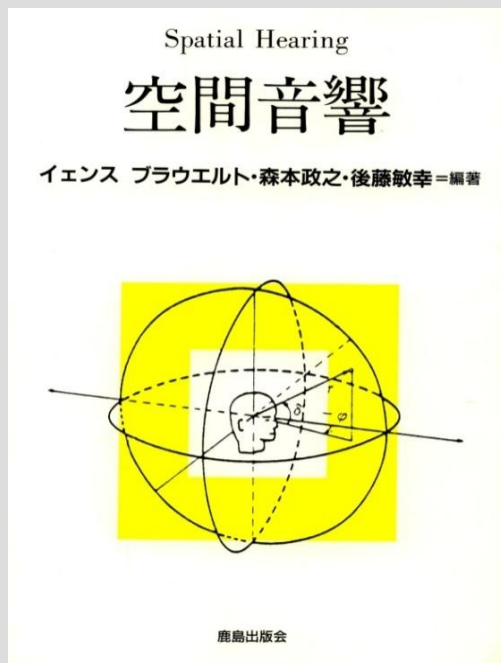
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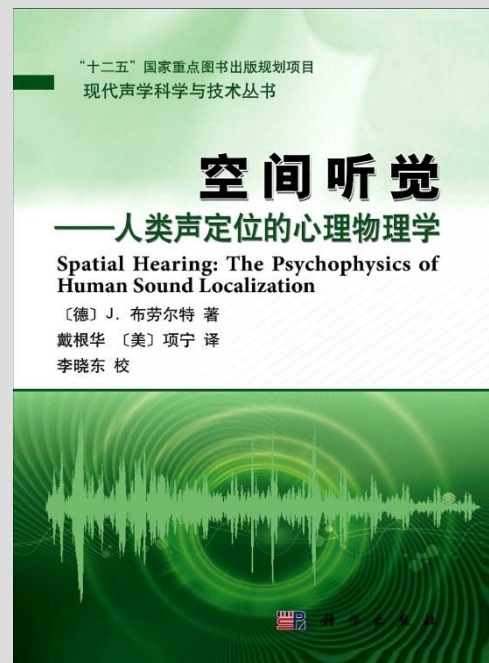
(b)



(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

 Springer

Communication Acoustics

Jens Blauert, ed. (2005)

Authors: *Jens Blauert, Jonas Braasch,
Hugo Fastl, Volkmar Hamacher,
Dorte Hammershøi, Ulrich Heute, Inga Holube,
Herbert Hudde, Ute Jekosch, Georg Klump,
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Verfahren, gebräuchliche Systeme
menschengerechte Gestaltung

(b)

- (a) Communication Acoustics
J. Blauert, ed. (Chinese) 2009
- (b) Speech Technology (German)
with E. Schaffert 1985

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

Jens Blauert *Editor*



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The Technology of Binaural Listening



 Modern Acoustics and Signal Processing

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Modern Acoustics and Signal Processing

Jens Blauert
Jonas Braasch *Editors*

The Technology of Binaural Understanding



Modern Acoustics and Signal Processing



Part 1: Forming and Interpreting Aural Objects: Effects and Models

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Auditory Gestalt Rules and their Application
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Auditory Room Learning and Adaptation to Sound
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Room Effect on Musicians' Performance
Malte Kob, Sebastià V. Amengual Garí and Zora Schärer
Kalkandjiev

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Jonas Braasch

Springer and ASA-Press
2021

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Tobias May, Borys Kowalewski and Torsten Dau

Ning Xiang
Jens Blauert

Acoustics for Engineers

Troy Lectures
Third Edition

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Acoustics for Engineers –Troy Lectures
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and for power and intensity**