Welcome to the Paper Session on akuTEK.info. Click on a title to be linked to the document.
Coloration due to reflections, by T Halmrast

Sound Coloration 13.03.2007
Coloration due to reflections — Further investigations. 03.08.2007

Computational Acoustics

A new software tool to facilitate NURB based geometries in acoustic design by O'Keefe et al 02.09.2013
Learning Modern Acoustical Design from Traditional Choir Venues by J O’Keefe 02.09.2013
Ali Gapu—Historical Persian music room by H Azad 10.01.2012
Diffusion in concert halls analysed as a function of time during the decay process. By C L Christensen and JH Rindel 24.05.2011
Prediction tools in acoustics—can we trust the PC? by M Vorländer 14.05.2010
How dry do the recordings for auralization need to be? by A Buen 31.01.2009
Acoustical Modelling with Sonel Mapping, by Kapralos, Jenkin and Milios. 25.09.2007

An Improved Energetic Approach to Diffraction Based on the Uncertainty Principle, by U Stephenson and P Svensson. 21.09.2007

Low Frequency Limit of Reflector Arrays

2008: Frequency limits of reflector arrays—status report 27.08.2008
2008: Frequency Response of Reflector Arrays
2007: The two-filter model. Edge density to cut off frequency relationship. Dependency on angle of incidence and shape. Frequency range 17.05.2007
2006: Panel edge density suggested as design parameter for concert hall reflectors

Large Room Acoustics—misc papers

Room Acoustical Parameters in predictions of concert hall preference — about uncertainties, explanation and understanding , by M Skålevik 22.03.2013

A new method to predict and measure the noise control performance of a performing arts centre displacement system, by J O'Keefe 28.08.2012

Korundi – The new home for the Lappland chamber orchestra, by H Möller 03.07.2012

The Logomo Hall, by Riionheimo et al 03.07.2012


On a new, variable absorption product and acceptable tolerances of T30 in halls for amplified music by Adelman-Larsen et al 06.03.2012

Audibility of direct sound as a key to understand clarity of music and speech by D Griesinger

Non-linear decays in simple spaces and their possible exploitation by M Barron 13.06.2011

The effect of scattering surfaces in rectangular concert halls by Green, Barron, Thompson 09.06.2011

Uncertainties of room acoustical measurements by I Witew and M Vorländer 09.06.2011

Concert Hall Parameters - We still haven’t found what we’re looking for by M Skålevik 19.04.2011

Queen Elisabeth Theatre: Acoustic design responding to financial realities by J O’Keefe 16.04.2011

Speech Intelligibility Measurements in Auditorium by K Leo 19.10.2010

Acoustic description of the Great hall of the Moscow P. I. Tchaikovsky Conservatory by H Möller et al 12.09.2010

Phase Coherence as a Measure of Acoustic Quality: by D Griesinger 03.09.2010

1 The Neural Mechanism:
2 Perceiving Engagement:
3 Hall Design

Sound Strength in Small Halls by J Hyde and H Möller 12.09.2010

Behaviour of lateral energy in small concert halls by H Möller and J Hyde 12.09.2010
How loud is my reverberation? by D Griesinger 03.09.2010

Room acoustical parameters at listeners' ears—can preferred concert hall acoustics be predicted and explained? (ICA 2010 preprint) by M Skålevik 17.06.2010

Early Design Criteria for Multipurpose Cultural Houses by A Buen 21.05.2010

Reverberation Time—the mother of all room acoustical parameters by M Skålevik 20.03.2010

Acoustical problems in large post-war auditoria by J O'Keefe 10.03.2009

The Queen Elisabeth Theatre - Spatial Sound in a Wide Room by J O'Keefe 10.03.2009

The Esplanade - From Plenum to Flytower by J O'Keefe 10.03.2009

Simplified room acoustic measurements by T Halmrast and A Buen 10.02.2009

Room acoustics in two variable acoustics coupled space venues by A Buen and L Strand 31.01.2009

Objective assessment of concert hall acoustics by M Barron 09.10.2008

Room acoustic parameters - distribution over concert hall seating area by M Skålevik 25.08.2008

When is a concert hall too quiet? by M Barron 23.09.2008

Diffusivity and its effect on concert hall seat absorption by M Skålevik 25.08.2008

Frequency Response of Reflector Arrays, a student project by M Dalámo, NTNU 2007, 09.04.2008

The Acoustics of a Quarry, Who needs an acoustician? T Halmrast asks. 03.08.2007

Diffusivity and directivity by M Skålevik. Early reverberant sound can compensate for unreliable direct sound. Read more in this paper. 09.10.2006

Influence of ceiling profile on distribution of room acoustical parameters by U Stephenson. 21.09.2007

Evaluation of Objective Echo Criteria, A Løvstad's Master Thesis on Echo Criteria, introducing a new criterion. 25.08.2006

Clarity and Source Blend This paper by G Ihlen, acoustician and member of The Norwegian Opera Orchestra, discusses clarity, source blend, transparency and their interrelation. 20.09.2006

Another Phantom of the Opera Are there more than one phantom in the opera? This paper introduces a possible acoustical phantom. 14.03.2007

Reflector above the opera orchestra pit by T Halmrast, A Buen, G Ihlen. How should the reflector be shaped, to meet the intensions? A case study from the Norwegian National Opera in Oslo. 14.03.2007

Small Room Acoustics

Musicians' perceived timbre and strength in (too) small rooms by T Halmrast 02.09.2013

The Hard Case - Improving Room Acoustics in Cuboid Rooms by using Diffusors - Scale model measurements by J Vennerød 28.08.2013


Schneider Frequency Revisited (Forum Acusticum 2011 paper) by M Skålevik 17.04.2011

Stage Acoustics

On Measurements of Stage Acoustic Parameters: Time Interval Limits and various Source–Receiver Distances by Wenmaekers et al 26.08.2013

The influence of Room Acoustic Aspects on the Noise Exposure of Symphonic Orchestra Musicians by Wenmaekers et al 26.08.2013

A Model for the prediction of Sound Levels within a Symphonic Orchestra based on measured Sound Strength by Wenmaekers et al 26.08.2013
Subjective and objective measures of relevance for the description of acoustics conditions on orchestra stages by A Gade 13.06.2013

Acoustics for Symphony Orchestras; status after three decades of experimental research by A Gade 04.03.2013

Reflection Density and Attenuation on Stages and Rehearsal Halls, J O'Keefe, 16.09.2010

Stage acoustics for symphony orchestras in concert halls, PhD thesis by JJ Dammerud. 20.05.2010

Earlier papers by Dammerud and Barron:

- **Stage conditions for orchestral performance**, by Dammerud / Barron. Early subjective and objective studies of concert hall stage conditions for orchestral performance. 21.09.2007
- **Stage Acoustics - Early investigations** A contemporary overview of investigations and a few results so far, by Mike Barron and JJ Dammerud. 02.05.2007

The content of this paper has been reviewed and included in the PhD thesis **Stage Acoustics for Symphony Orchestras in Concert Halls** 20.05.2010

**Stage Acoustics for a symphony orchestra—an investigation**, by Alf Berntson and Johan Andersson. 22.10.2007

**Sound transmission through a symphony orchestra**, by Magne Skålevik. Report on measurements on a stage with an orchestra present. 17.05.2007

**Orchestra Canopies—Significant Features** by Magne Skålevik. Orchestra canopies—do they make a useful difference and can it be measured? 13.10.2006

On the significance of stage floor construction, to instruments with endpin contact:

- **Double Basses on the Stage Floor** (2007 paper) by Guettler, Askenfelt and Buen
- **An in-depth analysis of the double bass to stage floor contact** (2008 paper) by Guettler, Askenfelt and Buen
- **The Lindeman Hall of Oslo — Evidence of low frequency radiation from the stage floor** (2010 paper) by Guettler, Askenfelt and Buen

**Violin Acoustics**

Seven papers by Anders Buen on violin acoustics are presented below. Published akutek.info 16.04.2007 thru 18.10.2010

- **On Timbre Parameters and Sound Levels of Recorded Old Violins**
- **What is old Italian timbre?**
- **Operating deflection modes in five conventional and two unconventional violins**
- **Can we hear the geometrical measures of a violin?**
- **Violin Acoustics History - a brief introduction**
- **Differences of sound spectra in violins by Stradivari and Guarneri del Gesú**
- **Comparing the sound of golden age and modern violins: Long-time-average-spectra**

Ariadne Westerkamp (1990): **Die Geige gestrichen und verglichen** (19MB) Published akutek.info 02.01.2012

English introduction and summary: **Sound of Science—108 violins talk** Published akutek.info 03.01.2012

**Voice acoustics**

**Sound radiation from the chest of bass singers** by Magne Skålevik, the SMAC-93 paper original print. The chest is to the voice like the port of vented loudspeaker enclosure is to the loudspeaker. 14.02.2008
External sources — www papers

Lord Rayleigh (1877/1894) The Theory of sound Vol 1

W.C Sabine  Collected Papers on Acoustics

D Griesinger: Why do Concert Halls sound different – and how can we design them to sound better?

P Svensson: "The Early History of Ray Tracing in Room Acoustics"

J Meyer: "Acoustical aspects of the conductor's situation in front of the orchestra"  (13MB pdf)

J Sundberg: "Arriving in time. A major concern for conductors & musicians"

A Krokstad: "The hundred years cycle in room acoustic research and design"  (19MB pdf)

A Krokstad: "The common-mode rejection of the ear and its influence on the hearing of born and unborn"

A Krokstad: Music and Communication  (12MB pdf)

G Fleischer: "Strategies of the hearing system against noise and auditory damage"  (25MB pdf)

L Beranek: "Objective and subjective evaluations of 23 opera houses in Europe, Japan and the Americas"

L Beranek: "Subjective rank-orderings and measurements of 58 concert halls"

L Beranek: "Analysis of Sabine and Eyring equations and their application to concert hall audience and chair absorption"

L Beranek: Concert Hall Acoustics 2008
M Barron: Using the standard on objective measures for concert auditoria, ISO 3382, to give reliable results

Witew, Behler, Vorländer: About just noticeable differences for aspects of spatial impressions in concert halls

J Jaffe: Innovative approaches to the design of symphony halls

Ueno, Kanamori Tachibana: A sound field simulation system for the study of ensemble performance on a concert hall stage

Rossing, Yoo, Morrison: Acoustics of percussion instruments: An update

Furuya et al: The influence of total and directional energy of late sound on listener envelopment

Kenji Kiyohara, Ken'ichi Furuya, Yutaka Kaneda: Sweeping echoes perceived in a regularly shaped reverberation room

A Levstad and P Svensson: Diffracted sound field from an orchestra pit

J Bradley: Using ISO 3382 measures, and their extensions, to evaluate acoustical conditions in concert halls

M Morimoto and K Iida: Appropriate frequency bandwidth in measuring interaural cross-correlation as a physical measure of auditory (apparent) source width (ASW)

Y Lam: Issues for computer modelling of room acoustics in non-concert hall settings

M Nagata (1989): Design problems of concert hall acoustics

M Nagata (1991): Active sound field control systems in auditoriums - Expectations and precautions

Ueno and Tachibana: Cognitive modeling of musician’s perception in concert halls

Nijs and de Vries The young architect’s guide to room acoustics

Hanyu and Hoshi: Relationship between reflected sound density and mean free path in consideration of room shape complexity

Kob, Behler, et al: Experimental investigations of the influence of room acoustics on the teacher’s voice

Manfred R. Schroeder (1980): Advances in architectural acoustics

T Lokki Subjective comparison of four concert halls based on binaural impulse responses
Imaging concert hall acoustics using visual and audio cameras

Allen and Berkley: Image method for efficiently simulating small-room acoustics

B Martin: What is the transmission loss of an open window?

Lokki and Pätyinen: Lateral reflections are favorable in concert halls due to binaural loudness

S Douady et al: The song of the dunes as a self-synchronized instrument

D'Antonio and Rife: The state of the art in the measurement of acoustical coefficients

K F Hansen: The acoustics and performance of DJ scratching

Bradley: Evolution of newer auditorium acoustics parameters

Olsson, Söderström and de Sousa Mestre: Sound levels for trumpet players in practice rooms

Olsson and Söderström, Master Thesis 2010: Perceived Sound Qualities for Trumpet Players in Practice Rooms (11.8MB)

Beranek, Jaffe, Nakajima, Kahle, Kirkegaard and Clements: "How acousticians listen?" (5.5MB)

Dammerud, Barron and Kahle: "Objective assessment of acoustic conditions on concert hall stages – limitations and new strategies"

Ueno and Tachibana: "A consideration on acoustic properties on concert-hall stages"

Chiang, Yi-run Chen, Chen and Hsu, "Stage acoustics for vineyard concert hall"

Pompoli, Farnetani and Prodi: "A note on the acoustics of orchestra rehearsal rooms"

Jang, Kim and Jeon: "Absorption of orchestra platform measured for the acoustical design of concert halls" (Scale model study)

Lautenbach and Vercammen: "Stage acoustics: Renovation of the concert hall de Doelen, Rotterdam and other stages"

Roy and Browne: "Classroom acoustics and green schools"

Luykx and Vercammen: "Natural speech intelligibility in theatres in relation to its acoustics"

Vigeant, Wang, Rindel, Christensen and Gade: "Multi-channel orchestral anechoic recordings for auralizations"

R Freiheit: "Creating an anechoic choral recording"

Pätyinen and Lokki: "Evaluation of concert hall auralization with virtual symphony orchestra"

T Gulsrud: "Loudspeaker simulation of a string quartet for in situ listening evaluation"

Choi, Lee, Joo and Jeong: "Effect of sample size on measurement of the absorption by seats"

Martijn Vercammen: "Improving the accuracy of sound absorption measurement according to ISO 354"

Tervo, Korhonen and Lokki: "Estimation of reflections from impulse responses"

You, Kim and Jeon: "Effects of absorption elements and stage set on the stage house acoustics in a proscenium hall"

Witew, Dietrich, Vorländer and de Vries: "Uncertainty of room acoustical measurements – How many measurement positions are necessary to describe the conditions in auditoria?"

Figueiredo and Polack: "Variations on acoustical measurement procedures and their influence on acoustical parameters"

J Bradley: "Review of objective room acoustics measures and future needs"

Alban Bassuet: "New acoustical parameters and visualization techniques to analyze the spatial distribution of sound in music spaces"
Lokki, Vertanen, Kuusinen, Päätynen and Tervo: “Auditorium acoustics assessment with sensory evaluation methods”

Marshall, Scelo and Exton: “Whole stage imaging for the control of sound strength in concert halls”

R Harris: “Auditorium acoustic design: 30 years, 15 projects”

L Tronchin: “The reconstruction of the Teatro Galli in Rimini: the acoustic design”

Gulsrud, Exton, van der Harten and Kirkegaard: “Room acoustics investigations in Hamer Hall at the Arts Centre, Melbourne”

Gul and Caliskan: “Acoustical considerations in the design of Heydar Aliyev Center Auditorium”

Komoda, Hakozaki and Toyota: “Acoustical design of new Danish Radio concert hall”

Chiang, Lin, Yeh and Hsu: “A mid-size concert hall with staggered terraced seating”

Yoo, Seo, Kim and Jeon: “Acoustical renovation of large auditorium to enhance sound strength and IACC”

Kim, Seo, Yoo and Jeon: “The effect of reflectors on sound strength (G) and IACC in a fan-shape hall”

Ellison and Schwenke: “The case for widely variable acoustics”

J Hyde: “Acoustical intimacy in concert halls—Does visual input affect the aural experience?”

Hidaka, Beranek and Nishihara: “A comparison of shoe-box halls and non-shoebox halls based on objective measurements in actual halls” (RECC)

J van Dorp Schuitman (Thesis): Auditory Modelling for Assessing Room Acoustics

Bradley and Soloudre: “Factors Influencing the Perception of Bass”

R Lacatis: Historical and chronological evolution of the concert hall acoustics parameters

H Arau-Puchades: An Improved Reverberation Formula

H Arau: The Refurbishment of the Orchestra Rehearsal Room of the Great Theater of Liceu

Neubauer and Kostek Prediction of the Reverberation Time in Rectangular Rooms with Non-Uniformly Distributed Sound Absorption

Sigrún Ragna Helgadóttir: SCHROEDER DIFFUSORS

Eckard Kahle: Influence of Size and Composition of the Orchestra on the Perception of Room Acoustical Quality

D Griesinger: FURTHER INVESTIGATION INTO THE LOUDNESS OF RUNNING REVERBERATION

Luxemburg et al: Stage acoustics: Experiments on 7 stages of concert halls in the Netherlands

Youngmin Kwon: Music Halls from the 18th to 20th Centuries: Changes in Acoustical and Architectural Criteria

J O'Keefe: The Influence of Height to Width Ratio and Side Wall Boxes on Room Acoustics Measurements

Kowaki et al: Survey of the Acoustics of Concert Halls in European Countries

Hameed, Pakarinen, Valde and Pulkki: Psychoacoustic Cues in Room Size Perception

Dilworth and Smyth: The acoustic requirements of the Irish Chamber Orchestra

Tenenbaum et al Acoustical Analysis of a Variable Roof Configuration Concert Hall: Sala Sao Paolo

A W Bronkhorst: Modeling Auditory Distance Perception in Rooms

A Bassuet: Acoustics of a selection of famous 18th century opera houses: Versailles, Gräffliches, Drottningholm, Schweitzingen

Kato, Ueno, Kawai: Musicians adjustment of performance to room acoustics, Part III: Understanding the variations in musical expressions
Klosak and Gade: Relationship between room shape and acoustics of rectangular concert halls

Oguchi and Toyota: Acoustic design of Shenzhen concert hall, Shenzhen, China

Zerhan Karabiber: Acoustical Problems in Mosques

Altinsoy and Blauert: Do we feel what we hear? (Loudness perceived as stronger though force is unchanged)

Alban Bassuet: Acoustics of Early Music Spaces from the 11th to 18th Century: Rediscovery of the Acoustical Excellence of Medium-Sized Rooms

Kwon and Siebein: Music Halls from the 18th to 20th Centuries: Changes in Acoustical and Architectural Criteria

Harald Jers: What Are the Differences Between Amateur and Professional Choirs?

Marshall, Valentine and Scoel: PHILHARMONIC ACOUSTICS

Stetson and Braasch: The Singers' Preferences for Acoustical Characteristics of Performing Spaces

Boner and Harght: The Festival Hill Concert Hall

Ronsse and Wang: Impacts of classroom acoustics on elementary student achievement

Parks and Braasch: You Are Now Free to Move Your Head around the Concert Hall

D Griesinger: How Can You Tell Who's Talking? The Ability to Separate Sounds by Pitch as a Key to Measuring the Clarity of Speech and Music

Dance et al: Improving Orchestra Pits for the Benefit of Musicians

Neville Fletcher: The Evolution of Musical Instruments

Tapio Lokki: Sensory Evaluation of Concert Hall Acoustics

Wulfrahn et al: Recent experiences with vibration of stage and audience floors in concert halls

Tervo, Päätynen, and Lokki: Spatio-temporal energy measurements in renowned concert halls with a loudspeaker orchestra

Beranek and Nishihara: Mean-free-paths in concert and chamber-music halls and validation of the Sabine/Eyring equations for predicting their reverberation times

Jofre et al: Evaluation of stage acoustics preference for a singer using oral-binaural room impulse responses

Ko et al: Augmented stage support in ensemble performance using virtual acoustics technology

Y Ando: Autocorrelation-based features for speech representation

Toyota, Oguchi and Nagata: Acoustical Design of Walt Disney Concert Hall

M Schröder: Remembering the Good Days at Bell Labs

M Sakurai: Computational Systems for Sound Fields, as Tools in Design and Diagnosis

Huttunen et al: Symphony orchestra musicians’ use of hearing protection and attenuation of custom-made hearing protectors as measured with two different real-ear attenuation at threshold methods

A Vink: Music and Emotion: - a relationship between music psychology and music therapy

Heyl, Chrisler and Snyder (1929): The Absorption of Sound at Oblique Angles of Incidence

Päätynen, Tervo and Lokki: Investigations on the development of the frequency response over time in concert halls
Robinson, Pätyinen and Lokki: The effect of diffuse reflections on spatial discrimination in a simulated concert hall

Pätyinen, Tervo and Lokki: Analysis of concert hall acoustics via visualizations of time-frequency and spatiotemporal responses

BBC research and development

BBC R&D report from 1933: Acoustics of Cardiff Studios (0.4s in "small", 1.2s in 730m3 and 0.25s in 25m3)

BBC R&D report from 1934: Aberdeen Studios

T Sommerville 1948: Acoustic measurements in Aberdeen studios

T Sommerville 1948: Listeners’ sound level preferences

T Sommerville: Götingen conference 1951

Gilford and Sommerville 1951: Acoustics of Royal Festival Hall

Sommerville, Gilford and Beadle 1952: Subjective comparison of concert halls

T Sommerville 1953: An Empirical Acoustic Criterion

T Sommerville 1955: Sound level distribution in concert halls

T Sommerville 1958: Acoustics in the BBC

T Sommerville: Visit to Scandinavia 1958

T Sommerville 1963: Architectural Acoustics and the Arts

Sommerville and Gilford 1963: Tonal quality in concert halls (Appendix: The Times article: "Is clarity all we want from our concert halls?")

BBC research report 1964: The choice and location of sound absorbers

Binaural hearing, Spaciousness, ASW, ENV/LEV/LE, LF and 1-iacc

M Schröder: Comparative Study of European concert halls: correlation of subjective preference with geometric and acoustic parameters

Spaciousness discussion (ASW, LE, LF, 1-iacc)

Typical values of LF and 1-IACC in famous concert halls

Bradley: Comparison of concert hall measurements of spatial impression

De Vries: Spatial fluctuations in measures for spaciousness

Jeon: Effect of sound strength and IACC on perception of listener envelopment in concert hall

Griesinger: Objective measures of spaciousness and envelopment

Beranek: Lateral Fraction and Binaural Quality Index (discussion Concert halls 2008, sect 2 and 3)

Baalman (Thesis): Spaciousness in concert halls. Perceptibility of IACC-differences

Sue Harding Binaural Processing

Stern, Wang, Brown Binaural Sound Localization

A Oxenham (Lecture) Binaural hearing

Div Authors, ICA 2001 session: Opera House Acoustics
Morimoto: The role of reflections from behind the listener on spatial impression

Morimoto: The relation between Spatial Impression and the Precedence Effect

Mason, Brookes and Rumsey: Spatial impression: measurement and perception of concert hall acoustics and reproduced sound

Arnaud Bidart: Do We Need Two Ears to Perceive the Distance of a Sound Source in a Room?
Stage Acoustics for symphonic orchestra

JJ Dammerud: The ST measures without the standard reference level


Wenmaekers et al (2011): A Model for the Prediction of Sound Levels within a Symphonic Orchestra based on measured Sound Strength [pdf]

Wenmaekers et al (2010): The influence of the orchestra on stage acoustics [pdf]

Luxemburg et al (2010): Stage acoustics further development of parameter LQ7-40 [pdf]

Luxemburg et al (2009): Stage acoustics experiments on 7 stages of concert halls in the Netherlands [pdf]


Braak et al (2005): Influence of stage risers on stage acoustics [pdf]

ISRA 2013 Toronto

Misc authors ISRA 2013 Toronto, all papers

Kalkandjiev and Weinzierl: Room acoustics viewed from the stage: Solo performers’ adjustments to the acoustical environment (not in new window)

Skålevik: Certainties and uncertainties from using a selection of data to predict concert hall preference

Beranek: Concert Hall Design: Some Considerations

A Bidondo: Neuroacoustics: Study on the perception of stereo reverberant sound field at cortical level

D Bradley: Comparison of hanging panels and boundary diffusers in a reverberation chamber

H Marshall: The acoustical design of the Christchurch Town Hall

E Kahle: Room acoustical quality of concert halls: perceptual factors and acoustic criteria – return from experience

M Vorländer: Simulation and Evaluation of Acoustic Environments

T Lokki: Throw away that standard and listen: your two ears work better
Listening levels

T Sommerville 1948: Listeners' sound level preferences

Muchnik et al: Preferred listening levels of personal listening devices in young teenagers: self reports and physical measurements (abstract)

L Warren: Correlating Preferred Listening Levels With Feelings In Children In Grades 3-8

Goshorn et al: iPod Preferred Listening Levels for College Students

M Sakurai: Listening Room for Testing the Individual Subjective Preference (A concert hall seat selection system)

E Deruty: 'Dynamic Range' & The Loudness War

Federman and Ricketts: Preferred and Minimum Acceptable Listening Levels for Musicians While Using Floor and In-Ear Monitors (Blog report)
ICA 2007 Madrid Concert Hall Acoustics session papers (for paper pdf download, click on corresponding ICA-icon)


RBA-06-003-IP. Acoustical demands for the conductor’s location. Meyer, Jürgen

RBA-06-004-IP. Auditory quality of performance spaces for music - the problem of the references. Blauert, Jens; Jekosch, Ute

RBA-06-005-IP. Concert hall acoustics: Science versus reality. Commins, Daniel

RBA-06-006-IP. When is a concert hall too quiet? Barron, Mike

RBA-06-007-IP. The acoustic design of the Molina de Segura theater-auditoria. Higini Arau-Puchades

RBA-06-008-IP. Concert acoustics criteria in the Frauenkirche Dresden. Ahnert, W.; Feistel, S.; Vorländer, M.

RBA-06-009-IP. Sound source for the measurement of room impulse responses for auralisation. Behler, Gottfried, K.

RBA-06-010-IP. Computation and applications of directional echograms in room and concert hall acoustics. Embrechts, Jean-Jacques

RBA-06-011-IP. New method for auralizing the results of room acoustics simulations. Rizzi, Lorenzo; Farina, Angelo; Galavarna, Paolo; Martignon, Paolo; Conti, Lorenzo; Rosati, Andrea

RBA-06-012-IP. Coloration due to reflections, further investigations. Halmrast, Tor

RBA-06-013-IP. Reverberation time, mean free path and sound absorption in concert halls. Hidaka Takayuki, Nishihara Nonko

RBA-06-014-IP. The modelling of frequency dependent boundary conditions in FDTD simulation of concert hall acoustics. Jeong, Hyok; Drumm, Ian; Homer, Brian; Lam, Yiu Wai

RBA-06-015-IP. Shoebox concert halls for the 21st Century. Orłowski, Raf

RBA-06-016-IP. The concert hall acoustic design of the Beijing National Grand Theatre of China. Schmich, Isabelle; Vian, Jean-Paul

RBA-06-017-IP. Effects of directivity of a sound source on speech intelligibility in the sound field. Daiji, Takahashi; Saori, Kuroki

RBA-06-018-IP. Acoustical design of New Concert Hall in Mariinsky Theatre, St. Petersburg. Toyota, Yasuhisa; Oguchi, Keiji; Motoo, Komoda

RBA-06-020-IP. Assessment of the uncertainty in room acoustical measurements. Ingo B. Witew; Pascal Dietrich

RBA-06-021-IP. Bayesian analysis in characterizing sound energy decay: A quantitative theory of inference in room acoustics. Xiang; Ning; Goggans, Paul M.; Jasa, Tomislav

RBA-06-022-IP. Acoustical aspects of the Sagrada Familia Church. Yoshikawa, Shigeru; Narita, Takafumi; Nishimoto, Yasuko

RBA-06-023. Two new solutions for adjustable acoustics in multi purpose concert halls. Agren, Anders

RBA-06-024. The interpretation of objective measurements on the stage by means of the correlation with subjective data. Astolfi, Arianna; Giovannini, Maria; Barbato, Giulio; Filippi, Marco

RBA-06-025. "Le Grand Théâtre de Provence": the Aix-en-Provence opera house acoustics. Commins, Daniel

RBA-06-026. Early subjective and objective studies of concert hall stage conditions for orchestral performance. Dammerud, Jens Jørgen, Barron, Mike

RBA-06-027. The subjective investigation of acoustic perception of musicians: a proposed method for interpretation of results. Genta, Gianfranco; Giovannini, Maria; Astolfi, Arianna; Barbato, Giulio

RBA-06-028. Acoustical evaluation of different acoustic conditions in the Queen’s Hall – The Royal Library, Copenhagen. Giovannini, Maria, Gade Anders Christian

RBA-06-029. Evaluation of stage acoustics in concert halls by investigating performer’s preference. Kim, Yong Hee; Seo, Chun Ki; Jeon, Jin Yong

RBA-06-030. Qualitative analysis of under-balcony acoustics in concert halls with multiple directional sources. Kwon, Youngmin; Siebein, Gary; Gold, Martin

RBA-06-031. Acoustics of the Mira Teatro of Pozuelo de Alarcón, Madrid. Ottobre, Daniel; Recuero, Manuel

RBA-06-032. Sound transmission between musicians in a symphony orchestra on a concert hall stage. Skålevik, Magne

RBA-06-033. Information transfer in auditoria. Summers, Jason E.

RBA-06-034. 1/16 scale model experiment for room acoustics: Physical properties and auralized sound quality. Tahara, Yasuhiko; Shimoda, Hidemaro

RBA-06-035. A basic study on stage acoustics for an orchestra conductor to estimate acoustic condition of audience area. Tokunaga, Yasunobu; Terashima, Takane

RBA-06-036. Study on non-linear system model of orchestra performance in auditorium. Terashima, Takane; Tokunaga, Yasunobu

RBA-06-037. Research on ceiling of acoustics in concert hall. Tu Mingchiu
RBA-06-038-IP. Our experience on the subjective perception in concert halls. A. Giménez; R. Cibrián; J. Romero, S. Cerda, J.L. Miralles; J. Segura

RBA-06-039. Auditory evaluation of impulse response reconstructed by correlation factor. Toru, Itakura; Hideo, Shibayama