

Resume of Henrik Schmidt

Personal Information

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Education

Technical University of Denmark	M.Sc.	1974
Dept. of Structural Engineering	Ph.D.	1978

Employment

Dept. of Structural Engineering Technical University of Denmark Research Fellow	1978-1980
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Risoe National Laboratory, Denmark Research Fellow	1980-1982
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NATO SACLANT ASW Center, Italy Scientist	1982-1985
Senior Scientist	1985-1987

M.I.T. Dept. of Mechanical Engineering Associate Professor	1987-1994
Professor of Mechanical & Ocean Engineering	1994-present
Associate Department Head of Ocean Engineering	1994-2005
Acting Department Head of Ocean Engineering	1/1/00-6/30/00
	9/01/02-12/31/04

M.I.T. Sea Grant Program Associate Research Director	1989-2002
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NATO SACLANT Undersea Research Centre Principal Scientist	1997-1998
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Memberships

Danish Center of Applied Mechanics and Mathematics
Acoustical Society of America, Fellow (1989)
Society of Exploration Geophysicists

Committees

Acoustical Society of America, Technical Council (1991-1994)
Acoustical Society of America, Executive Council (2000-2003)
AIP, Advisory Committee On Computing In Science & Engineering (2000–2003)
CORE, Ocean Observatories Steering Committee (2000 - present)

Patents

US No. 5,687,137: Methods and apparatus for adaptive oceanographic sampling.
US No. 5,894,450: Mobile underwater arrays.

Honors and Awards

1989 Fellow, Acoustical Society of America
1990-1993 Doherty Professorship in Ocean Utilization
1991-1994 Chair, ASA Technical Committee on Underwater Acoustics
1994 Chief Scientist for Acoustics, ONR Sea Ice Mechanics Initiative
1996 Chief Scientist ONR Frontal Dynamics PRIMER
1998 Chief Scientist GOATS '98 experiment
2000-2003 Executive Council, Acoustical Society of America
2005-2007 Lead PI ONR Undersea Persistent Surveillance Program
2005 Pioneers of Underwater Acoustics Medal, Acoustical Society of America

Areas of Work

1974-1978: Ph.D. for development of experimental, analytical, and numerical tools for non-destructive evaluation of structures by means of acoustic emission, including finite element algorithms for elastic wave propagation in cracked media.

1978-1982: Development of microprocessor controlled data acquisition system for acoustical emission. Development of integral equation method for modeling the interaction of piezoelectric transducers with elastic structures and scattering by cracks.

1982-1987: Development of hybrid, analytical-numerical models to seismo-acoustic propagation in the ocean environment, including the SAFARI code for modeling propagation in horizontally stratified fluid/elastic media, now in widespread use at most NATO country naval laboratories and several major universities. Determination of ocean

sediment geophysical properties from propagation characteristics of seismic interface waves. Beam propagation in stratified media. Rough surface scattering of elastic waves. Propagation characteristics of low-frequency, surface generated ambient noise in the ocean. Source parameter estimation by matched field processing.

Present: Arctic acoustics. Shallow water acoustics. Scattering and reverberation due to sea surface and ice roughness. Development of robust algorithms for parameter estimation by matched field processing. Determination of seismic-acoustic propagation and reverberation in range dependent ocean environments as well as anisotropic elastic media. 3-D acoustics in very shallow water with applications to seabed imaging and mine countermeasures using undersea vehicle methods. Acoustic tomography for coastal ocean observation and forecasting.

Consulting

Alliant Techsystems Inc., Arlington, VA
Atlantic Aerospace, Waltham, MA
Atlantic Applied Research Corp., Burlington, MA
Honeywell Advanced Marine Systems, Arlington, VA
Lawrence Livermore National Laboratory, Livermore, CA
Schlumberger-Doll Research, Ridgefield, CT
Schlumberger Cambridge Research, Cambridge, UK
National Center of Physical Acoustics, Oxford, MS
USEA, Lerici, Italy
Ødegaard & Danneskjold-Samsøe, Copenhagen, Denmark
OASIS, Concord, MA.
Applied Physics Laboratory, Univ. of Washington at Seattle
VASA Associates, McLean, VA

Publications

I. Books or Chapters

1. Jensen, F.B., Kuperman, W.A., Porter, M., and Schmidt, H., Computational Ocean Acoustics, American Institute of Physics, 1994
2. Diachok, O., Caili, A., Gerstoft, P., and Schmidt, H., {eds.}, Full Field inversion methods in ocean and seismic acoustics, Kluwer Academic Publishers, Dordrecht, The Netherlands. 1995.
3. Bovio, E., Tyce, R., Schmidt, H., *editors*. Autonomous Underwater Vehicle and Ocean Modelling Networks: GOATS 2000, SACLANTCEN CP-46, LaSpezia, Italy. 2000.

II. Refereed Journal Articles

1. Krenk, S., and Schmidt, H., "Vibration of an elastic circular plate on an elastic half space. A direct approach," *Journ. Appl. Mech.*, Vol. 48, no. 1, pp. 161-168, 1981.
2. Schmidt, H., and Krenk, S., "Asymmetric vibration of a circular elastic plate on an elastic half space." *Int. Journal of Solids and Structures*, Vol. 18, no. 2, pp. 91-105, 1982.
3. Krenk, S., and Schmidt, H., "Elastic Wave Scattering by a Circular Crack," *Phil. Trans. R. Soc. Lond.*, A308, pp. 167-198, 1982.
4. Schmidt, H., and Jensen, F.B., "An efficient numerical solution technique for wave propagation in horizontally stratified environments," *Comp.and Math. with Appl.*, 11, pp. 699-715, 1985.
5. Schmidt, H., and Jensen, F.B., "A full wave solution for propagation in multi-layered viscoelastic media with application to gaussian beam reflection at fluid/solid interfaces." *J. Acoust. Soc. Am.*, 77 (3), pp. 813-825, 1985.
6. Schmidt, H., and Glattetre, J., "A fast field model for three-dimensional wave propagation in stratified environments based on the global matrix method." *J. Acoust. Soc. Am.*, 78 (6), 2404-2114, 1985.
7. Schmidt, H., and Tango, G., "Efficient global matrix approach to the computation of synthetic seismograms," *Geophys. J. R. Astr. Soc.*, 84, 331-359, 1986
8. Kuperman, W.A., W., and Schmidt, H., "Rough surface elastic wave scattering in a horizontally stratified ocean," *J. Acoust. Soc. Am.*, 79, pp. 1767-1777, 1986.
9. Jensen, F.B., and Schmidt, H., "Subcritical penetration of beams into sediments," *J. Acoust. Soc. Am.*, 83 (2), pp. 571-579, 1987.
10. Baggeroer, A.B., Kuperman, W.A., and Schmidt, H., "Matched field processing" Source localization in correlated noise as an optimum parameter estimation problem," *J. Acoust. Soc. Am.*, 83 (2), pp. 571-587, 1988.
11. Schmidt, H., and Kuperman, W.A., "Estimation of surface noise source level from low-frequency seismo-acoustic ambient noise measurements," *J. Acoust. Soc. Am.*, 84 (6), pp. 2153-2162, 1988.
12. Kuperman, W.A., and Schmidt, H., 'Self-consistent perturbation approach to rough surface scattering in stratified elastic media," *J. Acoust. Soc. Am.*, 86, pp. 1511-1522, 1989.

13. Schmidt, H., Baggeroer, A.B., Kuperman, W.A., and Scheer, E.K., "Environmentally tolerant beamforming for high resolution matched field processing: Deterministic mismatch," *J. Acoust. Soc. Am.*, 88, pp. 1851-1862, 1990.
14. Gerstoft P., and Schmidt, H., "A boundary element approach to ocean seismo-acoustic facet reverberation," *J. Acoust. Soc. Am.*, 89, pp. 1629-1642, 1991.
15. Miller and Schmidt, H., "Observation and inversion of seismo-acoustic waves in a complex Arctic ice environment," *J. Acoust. Soc. Am.*, 89, pp. 1668-1685, 1991.
16. Rolt, K. and Schmidt, H., "Azimuthal ambiguities in synthetic aperture sonar and synthetic aperture radar imagery," *IEEE J. Oceanic Eng.*, 17 (1). Pp. 73-79, 1992.
17. Collins, M., Kuperman, W.A., and Schmidt, H., "Nonlinear inversion for ocean bottom properties," *J. Acoust. Soc. Am.*, 92 (5), pp. 2770-2783, November 1992.
18. Schmidt, H., "Numerically stable global matrix approach to radiation and scattering from spherically stratified shells." *J. Acoust. Soc. Am.*, 94 (4), pp. 2420-2430, 1993.
19. J-Y Liu, Schmidt, H., and Kuperman, W.A., "Effect of a rough sea bed on the spectral composition of deep ocean infrasonic ambient noise," *J. Acoust. Soc. Am.*, 93 (2), pp. 753-769, 1993.
20. Ricks, D. and Schmidt, H., "A numerically stable global matrix method for cylindrically layered shells excited by ring forces," *J. Acoust. Soc. Am.*, 95, (6), pp. 3339-3349, 1994.
21. Kurkjian, A., Coates, R.T., White, J.E., and Schmidt, H., "Finite difference and frequency-wavenumber modeling of seismic monopole sensors in fluid-filled boreholes," *Geophysics*, 59 (7), pp. 1053-1064, 1994.
22. LePage, K., and Schmidt, H., "Modeling of low frequency transmission loss in the Central Arctic," *J. Acoust. Soc. Am.*, 96 (3), pp. 1783-1795, 1994.
23. Goh, J.T. and Schmidt, H., "Validity of spectral theories for weakly range-dependent ocean environments—Numerical results," *J. Acoust. Soc. Am.*, 95 (2), pp. 727-732, 1994.
24. Rolt, K. and Schmidt, H., "Effects of refraction on synthetic aperture sonar imaging," *J. Acoust. Soc. Am.*, 95 (6), pp. 3424-3429, 1994.

25. Rolt, K., Schmidt, H., and Rolt, G.H., "Commentary on 'Effects of propagation on the operation of a synthetic aperture sonar' [*J. Acoust. Soc. Am.*, 82 (4) , 1403-1408, Oct. 1987]," *J. Acoust. Soc. Am.*, 96 (4), pp. 469-475, 1994.
26. Schmidt, H., and Kuperman, W.A., "Spectral and modal representations of the Doppler shifted field in ocean waveguides," *J. Acoust. Soc. Am.*, 96(4) 386-395, 1994.
27. Livingston, E. and Schmidt, H., " A comparison of the conventional, the minimum variance, and the multiple constraint matched field processors," *J. Comp. Acoust.*, 2(3), 217-229, 1994.
28. Schmidt, H., and Kuperman, W.A., "Spectral representations of rough interface reverberation in stratified ocean waveguides," *J. Acoust. Soc. Am.*, 97(4), 2199-2209, 1995.
29. Bondaryk, J., and Schmidt, H., "Array processing for the analysis of stiffened, fluid-loaded, cylindrical shells," *J. Acoust. Soc. Am.*, 97(2), 1067-1077, 1995.
30. Schmidt, H., Seong, W., and Goh, J.T., "Spectral super-element approach to range-dependent ocean acoustic modeling," *J. Acoust. Soc. Am.*, 98(1), 465-472, 1995.
31. Kapoor, T. and Schmidt, H., "Spherical coordinate Green's function for ring tractions in a solid unbounded medium," *J. Acoust. Soc. Am.*, 98(5), 2783-2791, 1995.
32. LePage, K., and Schmidt, H., "Analysis of spatial reverberation statistics in the Central Arctic," *J. Acoust. Soc. Am.*, 99(4), 2033-2047, 1996.
33. Bondaryk, J. and Schmidt, H., "Hybrid processing structure for the analysis of scattering from stiffened, fluid-loaded, cylindrical shells," *J. Acoust. Soc. Am.*, 99(4), 2176-2187, 1996.
34. Goh, J.T. and Schmidt, H., "A hybrid coupled waveguide integration approach to range-dependent seismo-acoustic modeling," *J. Acoust. Soc. Am.*, 100(3):1409-1420, 1996
35. Elisseeff, P., and Schmidt, H., "Acoustic propagation through a low Mach number, stratified flow," *J. Acoust. Soc. Am*, 101(4):1936-1944, April 1997
36. Kapoor, T., and Schmidt, H., "Acoustic scattering from a three-dimensional protuberance on a thin, infinite, submerged elastic plate, " *J. Acoust. Soc. Am.*, 102(1):256-265, July 1997.

37. Kapoor, T., and Schmidt, H., "Matched Field evaluation of acoustic scattering from rough Arctic ice," *J. Acoust. Soc. Am.*, 102(2):865-876, August 1997.
38. Goh, J.T., Schmidt, H., P. Gerstoft and W. Seong, " Benchmarks for validating range-dependent seismo-acoustic propagation codes," *IEEE Journal of Oceanic Engineering*, 22(2) ,1997.
39. Tracey, B., and Schmidt, H., "Seismo-acoustic field statistics in shallow water," *IEEE Journal of Oceanic Engineering*, 22(2):317-331,1997.
40. Cederberg, R.J., Collins, M., Schmidt, H., Siegmann W.L., "Rational operators for filtering," *J. Acoust. Soc. Am.*, 101(5):.02518-2523, 1997.
41. Dudko, Y., Schmidt, H., von der Heydt, K., Scheer, E., "Edge wave observation using remote seismoacoustic sensing of ice events in the Arctic," *J. of Geophys. Res.*, 103(C10):21775-21781, 1998.
42. Elisseeff, P., Schmidt, H., Johnson, M., Herold, D., Chapman, N.R., and McDonald, M.M. "Acoustic tomography of a coastal front in Haro Strait, British Columbia", *J. Acoust. Soc. Am.*,106(2):169-184,1999.
43. Schmidt, H., and Lee, J.Y., "Physics of 3-D scattering from rippled seabeds and buried targets in shallow water," *J. Acoust. Soc. Am*, 105(3):1605-1617,1999.
44. Tracey, B. and Schmidt, H., "A self-consistent theory for seabed volume scattering," *J. Acoust. Soc. Am.*, 106 (5):.2524-2534 , 1999.
45. Maguer, A., Bovio, E., Fox, W.L., Pouliquen, E., and Schmidt, H., "Mechanisms for subcritical penetration into a sandy bottom: Experimental and modeling results," *J. Acoust. Soc. Am*, 107(3): 1215, 2000.
46. Maguer, E. Bovio, W.L Fox, and H. Schmidt. "*In situ* estimation of sediment sound speed and critical angle," *J. Acoust. Soc. Am J. Acoust. Soc. Am.*, 108 (3) Pt.1: .987-996, Sept. 2000.
47. K. Lepage and H. Schmidt. "Spectral integral representations of volume scattering in sediments in layered waveguides," *J. Acoust. Soc. Am.*, 108 (4); 1557-1567, October 2000
48. M. D. Collins, H. Schmidt, and W. L. Siegmann, "An Energy-Conserving Spectral Solution," *J. Acoust. Soc. Am.* 107(4), 1964--1966 (2000).
49. LePage, K., Schmidt, H. "Bistatic synthetic aperture imaging of proud and buried targets from an AUV". *IEEE Journal of Oceanic Engineering* 27(3) pp. 471-483, 2002.

50. J. R. Edwards, H. Schmidt and K. LePage, "Bistatic synthetic aperture target detection and imaging with an AUV". *IEEE Journal of Oceanic Engineering* 26(4) pp. 690-699, 2001.
51. LePage, K., Schmidt, H. "Spectral integral representations of monostatic backscattering from threedimensional distributions of sediment volume inhomogeneities". *Journal of the Acoustical Society of America*, 113(2), 789-799, 2003.
52. Tesei, A., Lim, R., Maguer, A., Fox, W.L.J., Schmidt, H. "Measurements of acoustic scattering from partially and completely buried spherical shells". *Journal of the Acoustical Society of America* 112(5), 1817-1830, 2002.
53. Elisseeff, P., Schmidt, H., Xu, W. "Ocean acoustic tomography as a data assimilation problem". *IEEE Journal of Oceanic Engineering*, Vol. 27, No. 2, pp275-282, April 2002.
54. Xu, W., Schmidt, H. "System-orthogonal functions for sound velocity profile perturbation". *IEEE Journal of Oceanic Engineering*, Vol. 31, No. 1, pp. 156-169, January 2006.
55. M. Montanari, J.R. Edwards, and H. Schmidt. "Autonomous Underwater Vehicle-based Concurrent Detection and Classification Concept Using Higher-order Spectral Analysis," *IEEE Journal of Oceanic Engineering*, Vol. 31, No. 1, pp. 188-199, January 2006.
56. Xu, W., Baggeroer, A.B., Schmidt, H., "Performance Analysis for Matched-Field Source Localization: Simulations and Experimental Results", *IEEE Journal of Oceanic Engineering*, Vol. 31, No. 2, pp. 325-344, April 2006.
57. D.P. Eickstedt, M.R. Benjamin, J.P. Ianniello, H. Schmidt, and J.J. Leonard, "Adaptive Tracking of Underwater Targets with Autonomous Sensor Networks," (Unclassified) *JUA(USN)* **56**, 465-495 (2006) (Secret NoForn).
58. Lucifredi, I., Schmidt, H., "Subcritical scattering from buried elastic shells", *J. Acoust. Soc. Am.* **120** (6), pp. 3566-3583, December 2006.

III. Conference Proceedings

1. Schmidt, H., "Udbredelse af akustik emission," (Propagation of acoustic emission), *Materialnyt* nr. 2:78, Danish Society of Materials testing and research, 1978, pp.14-26.
2. Schmidt, H., "Kaiser Effect as Indicator of Structural Integrity of Solids," *Proceedings of the Institute of Acoustics, International Conference on Acoustic Emission and Materials Evaluation*, London, April 1979.

3. Schmidt, H., "Excitation and propagation of interface waves in a stratified seabed," in *Acoustics and the Sea-Bed*, Ed. N.G. Pace, Bath University Press, Bath, U.K., pp. 327-334, 1983.
4. Schmidt, H., "Modeling of pulse propagation in layered media using a new fast-field program," in *Hybrid Formulation of Wave Propagation and Scattering*, Ed. L.B. Felsen, Martinus Nijhoff Publishers, The Hague, 1984.
5. Schmidt, H., and Tango, G., "Numerically efficient full wavefield approach to synthetic seismogram computation," In *Acoustic Imaging*, Eds. A.J. Berkhout, J. Ridder and G.F. Van der Wal, Plenum Press, New York, 1985.
6. Schmidt, H., and Jensen, F.B., "Evaluation of experimental techniques for determining the plane wave reflection coefficient at the sea floor," In *Ocean Seismo-Acoustics*, Eds. T. Akal and J.M. Berkson, Plenum Press, New York, 1986.
7. Jensen, F.B. and Schmidt, H., "Shear properties of ocean sediments determined from numerical modeling of Scholte wave data," In *Ocean Seismo-Acoustics*, Eds. T. Akal and J.M. Berkson, Plenum Press, New York, 1986.
8. Akal, T., Schmidt, H., and Curzi, P., "The use of Love waves to determine the geoacoustic properties of marine sediments," in *Ocean Seismo-Acoustics*, Eds. T. Akal and J.M. Berkson, Plenum Press, New York, 1986.
9. Schmidt, H., and Kuperman, W.A., "A fine wave element approach to the solution of the wave equation in horizontally stratified environments with rough interfaces," In *Proceedings of the 11th IMACS World Congress on System Simulation and Scientific Computation*, Oslo, Norway, 1985.
10. Schmidt, H., "Propagation of seismic and acoustic waves in horizontally stratified media with stochastically rough interfaces," In *Progress in Underwater Acoustics*, Ed. H.M. Merklinger, Plenum Press, New York, 1987.
11. Jensen, F.B., and Schmidt, H., "Spectral decomposition of PE fields in a wedge-shaped ocean," In *Progress in Underwater Acoustics*, Ed. H.M. Merklinger, Plenum Press, New York, 1987.
12. Kuperman, W.A., Schmidt, H., and Jensen, F.B., "Modeling the effects of ice elasticity and roughness on low frequency Arctic acoustics," In *Proceedings of the International Congress of Acoustics*, Toronto, Canada, 1986.
13. Baggeroer, A.B., Kuperman, W.A., and Schmidt, H., "Performance bounds on array processing for source localization using full wavefield modeling of signal

- and noise fields,” In *Computational Acoustics: Algorithms and Applications*, Eds. D. Lee, R.L. Sternberg and M.H. Schultz, Elsevier Science Publishers, 1988.
14. Schmidt, H., Akal, T., and Kuperman, W.A., “Low frequency wind generated ambient noise in shallow water,” in *Sea Surface Noise*, Ed. B. Kerman, Kluwer, Dordrecht, NL, 1988.
 15. Schmidt, H., Baggeroer, A.B., Kuperman, W.A., and Scheer, E.K., “Robust beamforming for matched field processing under realistic environmental conditions,” in *Underwater Acoustic Data Processing*, Ed. Y.T. Chan, Kluwer, Dordrecht, NL, 1989; and *Proceedings of the 1988 NATO ASI on Signal Processing and its Applications to Underwater Acoustics*, Plenum Press, New York, 1989.
 16. Schmidt, H., “Wavefield conversion synthesis in finely layered media,” In *Expanded Abstracts, Society of Exploration Geophysicists, 58th Annual International Meeting*, Anaheim, CA, 1988.
 17. Kuperman, W.A., and Schmidt, H., “Scattering field from rough interfaces in stratified elastic media,” *Proceedings of the 2nd IMACS Symposium on Computational Acoustics*, Princeton Univ., March 1989.
 18. Schmidt, H., “Coupling of surface generated ambient noise into seismic interface waves,” Proc. Int. Conf. *Propagation and noise in underwater acoustics*, Auckland, New Zealand, Feb. 7-9, 1990.
 19. Gerstoft P., Schmidt, H., and Vilmann, O., “Shear wave conversion due to subbottom facets,” In: *Shear waves in marine sediments*, Ed. J.M. Hovem, M.D. Richardson and R.D. Stoll, Kluwer, Dordrecht, NL. 1991.
 20. Kuperman, W.A., Collins, M.D., and Schmidt, H., “A fast simulated annealing algorithm for the inversion of marine sediment seismo-acoustic parameters,” In: *Shear waves in marine sediments*, Ed. J.M. Hovem, M.D. Richardson and R.D. Stoll, Kluwer, Dordrecht, NL. 1991.
 21. Schmidt, H., “Numerical modeling in ocean seismo-acoustics,” Proceedings, OCEANS-91, Honolulu, HI, Oct. 1-3, 1991.
 22. Liu and Schmidt, H., “Rough seabed scattering of surface-generated ambient noise,” Proceedings of the Fifteenth National Conference on Theoretical and Applied Mechanics. Tainan. Taiwan, R.O.C., December 13-14, 1991.
 23. Schmidt, H., “Numerical modeling of three-dimensional reverberation from bottom facets,” Ocean Reverberation Symposium, A NATO SACLANT Undersea Research Centre Conference, La Spezia, Italy, May 25-29, 1992.

24. LePage, K., Schmidt, H., and Kuperman, W.A., "Experimental and theoretical analysis of spatial coherence on a horizontal array under the arctic ice." Proceedings of the European Conference on Underwater Acoustics, Luxembourg, September 1992.
25. Kurkjian, A., Schmidt, H., White, J.E., Chouzenoux, C., and Marzetta, T.L., "Numerical modeling of cross well seismo monopole sensor data," Society of Exploration Geophysicists, Annual Meeting, New Orleans, October 25-29, 1992.
26. Deffenbaugh, M., Schmidt, H., and Bellingham, J., "Acoustic navigation for arctic under-ice AUW missions," *Proc. Ocean '93*, pages I-240-9, 1993.
27. Bellingham, J., Deffenbaugh, M., Leonard, J., Catipovic, J., and Schmidt, H., "Arctic under-ice survey operations," *Proc. 8th Int. Symp. Unmanned Untethered Submersible Technology*, pages 50-59, 1993.
28. Orcutt, Cox, C.S., Kibblewhite, A.C., Kuperman, W.A., and Schmidt, H., "Observations and causes of ocean and seafloor noise at ultra-low and very-low frequencies," in *Natural Physical Sources of Underwater Sound: Sea Surface Sound (2)*, edited by B.R. Kerman (Kluwer, Dordrecht, 1993), pp. 203-232.
29. Baggeroer, A.B., and Schmidt, H., "Parameter estimation bounds and the accuracy of full field inversions," In O. Diachok, et. al. Editor, *Full field inversion methods in ocean and seismic acoustics*, Kluwer Academic Publishers, Dordrecht, The Netherlands, 1994.
30. Schmidt, H., and Baggeroer, A.B., "Physics-imposed resolution and robustness issues in siemso-acoustic parameter inversion," In O. Diachok, et. al. Editor, *Full field inversion methods in ocean and seismic acoustics*, Kluwer Academic Publishers, Dordrecht, The Netherlands, 1994.
31. Siedenburg, Lehtomaki, N., Arvelo, J., Rao, R., and Schmidt, H., "Interactive full-field inversion using simulated annealing," In O. Diachok, et. al. Editor, *Full field inversion methods in ocean and seismic acoustics*, Kluwer Academic Publishers, Dordrecht, The Netherlands, 1994.
32. Schmidt, H., "Seismo-acoustics of the Arctic ice cover," In L. Bjørnø, editor, *Underwater acoustics*, European Commission, Luxembourg, 1994.
33. Goh, J.T. and Schmidt, H., "Benchmark cases for range-dependent seismo-acoustic propagation codes," Presented at the 130th Meeting Acoustical Society of America, St. Louis, MO, (Nov-Dec 1995).
34. Tracey, B., and Schmidt, H., "An integrated modal approach to waveguide reverberation," Presented at the 130th Meeting Acoustical Society of America, St. Louis, MO, (Nov-Dec 1995).

35. Schmidt, H., and Fan, H., "Modeling of three-dimensional seismo-acoustic reverberation from anisotropic roughness patches," Presented at the 130th Meeting Acoustical Society of America, St. Louis, MO, (Nov-Dec 1995).
36. Schmidt, H., "Matching wave-number-integration approach to range-dependent, two-way, seismo-acoustic propagation modeling," Presented at the 129th Meeting Acoustical Society of America, Washington D.C. (May- June 1995).
37. Schmidt, H. and Dudko, Y., "Seismo-acoustic remote sensing and inversion of sea ice fracture events," Presented at the 129th Meeting Acoustical Society of America, Washington D.C. (May- June 1995).
38. Rao, R., Schmidt, H., and Vandiver, J.K., "Spectral integral approach to radiation from fluid-filled boreholes," Presented at the 131st Meeting Acoustical Society of America, Indianapolis, IN (May 1996).
39. Rao, R., Schmidt, H., and Vandiver, J.K., "Wave field visualization as an interpretational tool in borehole geophysics." presented at the 131st Meeting Acoustical Society of America, Indianapolis, IN (May 1996).
40. Elisseeff, P., and Schmidt, H., "Acoustic propagation through a low Mach number, stratified flow," Presented at the 131st Meeting Acoustical Society of America, Indianapolis, IN (May 1996).
41. Deffenbaugh, M. and Schmidt, H., "Robust ray path identification for ocean acoustic tomography," Presented at the 131st Meeting Acoustical Society of America, Indianapolis, IN (May 1996).
42. Deffenbaugh, M., and Schmidt, H., " Improved empirical orthogonal functions for ocean acoustic tomography," Presented at the 131st Meeting Acoustical Society of America, Indianapolis, IN (May 1996).
43. Bellingham, J., Schmidt, H., Deffenbaugh, M., and Johnson, M., "Acoustically focused oceanographic sampling in the Haro Strait experiment," Presented at the 3rd Joint Meeting of the Acoustical Societies of America and Japan, Honolulu, HA (December 1996).
44. Elisseeff, P., and Schmidt, H., "Acoustic tomography of a coastal front in Haro Strait, British Columbia," Presented at the 3rd Joint Meeting of the Acoustical Societies of America and Japan, Honolulu, HA (December 1996).
45. Deffenbaugh, M., Schmidt, H., and Johnson, M., "Coastal front tomography: High resolution ray-based techniques from the Haro Strait experiment," Presented at the 3rd Joint Meeting of the Acoustical Societies of America and Japan, Honolulu, HA (December 1996).

46. Dudko, Y. and Schmidt, H., "Seismoacoustic remote sensing of 'edge waves' in the Arctic ice cover," Presented at the 3rd Joint Meeting of the Acoustical Societies of America and Japan, Honolulu, HA (December 1996).
47. Sperry, B., Goh, J.T., Baggeroer, A.B., and Schmidt, H., "Possible Mechanisms for T-Phase Generation," Presented at the 3rd Joint Meeting of the Acoustical Societies of America and Japan, Honolulu, HA (December 1996).
48. Schmidt, H., Bellingham, J., Johnson, M., Herold, D., Farmer, D.M. and Pawlowicz, R., "Real-Time frontal mapping with AUVs in a Coastal Environment" Proceedings Oceans '96, Ft. Lauderdale, FL, 1996.
49. Deffenbaugh, M., Schmidt, H., and Bellingham, J., "Acoustic positioning in a fading multipath environment," *Proc. Ocean '96*, pages 596-600.
50. Deffenbaugh, M., Schmidt, H., and Bellingham, J., "The relationship between spherical and hyperbolic positioning," *Proc. Oceans '96*, pages 590-5, 1996.
51. Collins, M., Schmidt, H., and Siegmann, W., "Energy-conserving spectral solutions," *133rd Meeting of the Acoustical Society of America*, State College, PA, 1997.
52. Lee, J.Y. and Schmidt, H., "Multistatic scattering from bottom targets in the presence of anisotropically rough surfaces," *133rd Meeting of the Acoustical Society of America*, State College, PA, 1997.
53. Schmidt, H., "A virtual source algorithm for range-dependent, two-way seismoacoustic propagation modeling", In: R. Zhang and J. Zhou, editors, *Shallow Water Acoustics 1997 International Conference on Shallow-Water Acoustics*, Beijing, China.
54. Schmidt, H., Lee, J.Y., Fan, H., and Lepage, K., "Multistatic bottom reverberation in shallow water," In: N.G. Pace, E. Pouliquen, O. Bergem and A.P. Lyons, editors *High Frequency Acoustics in Shallow Water*, Series CP-45, 1997.
55. Schmidt, H., Bellingham, J., and Elisseeff, P., "Acoustically Focused Oceanographic Sampling in Coastal Environments," *Rapid Environmental Assessment*, SACLANTCEN Conference Proceedings Series CP-44, 1997.
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