# DIPEN N. SINHA

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**PERSONAL STATEMENT**

I started the Acoustics & Sensors Team at the Los Alamos Laboratory 20 years ago and I lead a team of physicists and engineers to address challenging technological problems for the US government and industry. I have a very wide range of interests and background that help me solve difficult technical problems in many fields. I started my career as a postdoctoral fellow in the field of low-temperature physics. In 1983, I moved to the Rockwell International Corporation in California where, as a senior scientist, where I developed 2D infrared detector arrays for space applications. I returned to LANL in 1986 as a staff scientist and developed ultra-high speed measurement techniques, femtosecond lasers, thermionic integrated circuits, and sensors based on Langmuir-Blodgett films. Next, I switched my research career and taught myself acoustics. I ended up developing the Acoustic Resonance Spectroscopy and the Swept Frequency Acoustic Interferometry techniques specifically to solve some challenging technical problems. These techniques served as the foundation for the development of sensors that range from detecting biological and chemical warfare agents to sensors for oil exploration. My current research involves developing noninvasive measurement techniques, manipulation of particles with sound, creating novel materials using sound, nonlinear acoustics, and imaging objects with sound. Developing new sensing techniques and sensors for human health monitoring and medical diagnosis that are simple and inexpensive is something that I am really passionate about. My Other research interests include the study of the dynamics of phase transitions in fluids using acoustics, thermometry of various kinds, and biomedical instrumentation.

**PROFESSIONAL EXPERIENCE**

Los Alamos Laboratory Fellow, Scientist 5

Member of International Editorial Board: Emerging Materials Research Journal

Member of the Board of Directors of the Society for Brain Mapping & Therapeutics

Guest Editor: Ultrasonic Sensors

***January 1996 - present:*** Leader, Acoustics and Sensors Team, MPA-11, LANL
Responsible for building this team from ground up and establishing the acoustics and sensors research laboratory at LANL. As a leader, I am responsible for innovation, creative technical problem solving, and developing a wide range of sensors to support government and industry needs.

***January 1993 – December 1996:*** Project Leader, NDE programs for treaty verification, LANLDeveloped acoustic-based noninvasive sensors for chemical and biological weapons in support of UN treaty verification, homeland defense, and nonproliferation activities. This focused on the development of the Acoustic Resonance Spectroscopy (ARS) and the Swept Frequency Acoustic Interferometry (SFAI) techniques for noninvasive and stand-off interrogation of chemicals in sealed containers. The instruments developed were used worldwide by the US government.

***January 1986 - December 1993:*** Technical Staff Member, MPA-11, LANL
Developed novel high-speed electronic measurement technique using femtosecond lasers and photo-conducting switch; developed thermionic integrated circuits for high temperature operations; used organic thin films as sensitive chemical sensors for the environment; worked on the development of high-temperature superconductor devices; and designed novel spectroscopic techniques for electrochemical cells.

***June 1983 - December 1986:*** Senior Member of Technical Staff, Rockwell International, CA Responsible for developing characterization techniques for Hg-Cd-Te infrared 2D detector arrays for space applications.

**July 1980 - June 1983:** Director's Postdoctoral Fellow, Condensed Matter Physics, LANL Studied the dynamics of phase transitions in liquid He3-He4 mixtures experimentally. Developed novel optical spectroscopic techniques for studying such phase transitions.

**EDUCATION:**

Ph.D., Physics, Portland State University, Oregon, 1980.

D.I.I.T. Post-Graduate Diploma in Industrial Physics, Indian Institute of Technology, Kharagpur, India, 1973.

M. Sc., Physics, Indian Institute of Technology, Kharagpur, India, 1972. B. Sc.,Physics with Honors, St. Xavier's College, Ranchi, India, 1970.

**AWARDS AND HONORS**

2014 Richard P. Feynman Innovation Award
2014 **R&D 100 Award** for Safire
2010 Distinguished Licensing Award, Los Alamos National Laboratory
2008 Distinguished Patent Award, Los Alamos National Laboratory
2007 Distinguished Patent Award, Los Alamos National Laboratory
2005 Distinguished Performance Award for contributions to starting the Chevron-LANL Alliance, Los Alamos National Laboratory
2003 Siemens-Westinghouse Mentor Award
2001 Distinguished Licensing Award – Los Alamos National Laboratory

2001 Outstanding Alumni Award, Portland State University
2000 **R&D 100** Award for ANDE-Advanced Nondestructive Evaluation System
1997 Distinguished Performance Award for contributions to Arms Control and Chemical Weapons Treaty Verification, Los Alamos National Laboratory
1995 **R&D 100** Award for ARS Chemical Fill Detector
1992 Popular Science 100 award for Acoustic Salmonella Detector
1990 **R&D 100** Award for Solid State Nitrogen Dioxide Sensor

**MAJOR TECHNICAL ACHIEVEMENTS**

- Developed an acoustic based fabrication technique using nano/micro particles for creating novel materials (tunable periodic structures in 1D, 2D and 3D) that is rapid (~10 s), inexpensive, and table-top. Once fully developed and refined, it is expected to have a major impact in the area of nanofabrication
- Demonstrated metamaterial-based sound beam shaping for underwater communication.
- Developed high power, low-frequency, highly collimated sound-beam generation. This has applications in down-hole imaging and also imaging of objects in highly attenuating materials, such as drilling mud.
- Acoustic manipulation of gas in chemical reactors and also in multiphase flow systems.
- Developed the Swept Frequency Acoustic Interferometry (SFAI) technique for the noninvasive identification of chemical warfare agents in munitions and sealed containers. This became a major DoD funded project in support of chemical weapons treaty verification and counter-proliferation, and brought LANL a lot of recognition. The chemical weapons detection work received an R&D100 award. This has since become a general purpose acoustic technique for fluid characterization. Chevron is currently in the process of commercializing this technique for oil exploration related work.
- Developed the technique of sound projection (collimated beam at low frequency) coupled with laser Doppler resonance vibration measurement to identify chemicals in sealed containers from a distance of 10-15 feet. It received an R&D 100 award. Others have since adapted this technique for stand-off underground mine detection and concealed weapons detection.
- Conceived and developed a novel approach to acoustic concentration of aerosol and biological cells. This resulted in a major tech transfer to industry and the development of commercial product – Acoustic Flow Cytometer. This work was also picked as the top 5 inventions for 2005 by McGraw-Hill and Scientific American.
- Developed a unique acoustic flashlight technique for imaging with applications ranging from biomedical imaging to near borehole imaging in oil exploration.
- Chemistry at a distance: developed the technique to launch chemicals in a vortex ring as a transporter to seed the air at a distance with fluorescent labels for detecting biological warfare agents from a distance. DARPA originally funded this as a proof-of-concept effort. This has since served as the seed for a major multimillion

dollar effort by DARPA.

- Developed the acoustic salmonella detector that received worldwide recognition and publicity. It resulted in a Popular Science 100 award.
- Invented a very simple solid-state nitrogen dioxide detector. This effort resulted in an R&D100 award.
- Developed a novel magnetoresistive thermometry technique for the first measurement of homogenous nucleation temperature of liquid helium. NIST considers these measurements as the standard. Later generalized this technique for use with any cryogenic liquid.

**PATENTS**

40 patents issued, 10 pending

Patents licensed to companies: 24 (Chevron Corporation, Interferometrics, Edge Technology, Safety Scan Technology, and ACS (Life Technologies). NDA with 42 companies).

1. US Patent 9,354,346, Cung Vu; **Dipen N. Sinha**; Cristian Pantea;, "Acoustic source for generating an acoustic beam"
2. US Patent 9,354,094, **Dipen N. Sinha**, "Apparatus and method for noninvasive particle detection using Doppler spectroscopy"
3. US Pat No. 9,234,779, **Dipen N. Sinha**, "Integrated acoustic phase separator and multiphase fluid composition monitoring apparatus and method"
4. US Pat No. 9,199,217, Naveen N. Sinha, **Dipen N. Sinha,** Gregory Russ Goddard, "Material fabrication using acoustic radiation forces"
5. US Pat No. 9,103,944, Cung Vu, **Dipen N. Sinha**, Cristian Pantea , "System and method for sonic wave measurements using an acoustic beam source"
6. US Pat No. 9,074,979, Gregory Kaduchak, Greg Goddard, Gary Salzman, **Dipen N. Sinha**, John C. Martin, Christopher Kwiatkowski, Steven Graves, "Ultrasonic analyte concentration and application in flow cytometry"
7. US Pat No. 8,820,147, **Dipen N. Sinha**, "Multiphase fluid characterization system"
8. US Pat No. 8,783,109, Gregory Kaduchak, Greg Goddard, Gary Salzman, **Dipen N. Sinha**, John C. Martin, Christopher Kwiatkowski, Steven Graves, "Ultrasonic analyte concentration and application in flow cytometry"
9. US Pat No. 8,722,155, Bart Raeymaekers, **Dipen N. Sinha**, "Method to manufacture bit patterned magnetic recording media"
10. US Pat No. 8,640,529**, Dipen N. Sinha,** "Integrated acoustic phase separator and multiphase fluid composition monitoring apparatus and method **"**
11. US Pat No. 8,559,269: Cung Vu, **Dipen N. Sinha**, Cristian Pantea, "Device and method for generating a beam of acoustic energy from a borehole, and applications thereof".
12. US Pat No. 8,547,791: Cung Vu, **Dipen N. Sinha**, Cristian Pantea, "Device and

method for generating a beam of acoustic energy from a borehole, and applications thereof".

13. US Pat No. 8,547,790: Cung Vu, **Dipen N. Sinha**, Cristian Pantea, "Device and method for generating a beam of acoustic energy from a borehole, and applications thereof".
14. US Pat No. 8,259,530: Cung Vu, **Dipen N. Sinha**, Cristian Pantea, Kurt Nihei, Denis P. Schmitt, and Christopher Skelt, 'System for generating a beam of acoustic energy from a borehole, and applications thereof', Sep 4, 2012.
15. US Pat No. 8,233,349: Cung Vu, **Dipen N. Sinha**, Cristian Pantea, Kurt Nihei, Denis P. Schmitt, and Christopher Skelt, "System for generating a beam of acoustic energy from a borehole, and applications thereof".
16. US 8,231,707**: Dipen N. Sinha, "**Gas separation using ultrasound and light absorption", July 31, 2012
17. US Pat No. 8,176,783, **Dipen N. Sinha**, "Non-contact fluid characterization in containers using ultrasonic waves", May 15, 2012
18. US Pat No. 8,166,801, **Dipen N. Sinha, "**Non-invasive fluid density and viscosity measurement", May 1, 2012
19. US Pat No. 7,963,165, **Dipen N. Sinha,** "Non-contact feature detection using Lamb waves"
20. US Pat No. 7,852,091, **Dipen N. Sinha**, "Microwave determination of location and speed of an object inside a pipe"
21. US Pat No. 7,839,718, Cung Vu, **Dipen N. Sinha**, Cristian Pantea, Kurt Nihei, Denis P. Schmitt, and Christopher Skelt, "Device and method for generating a beam of acoustic energy from a borehole, and applications thereof"
22. US Pat. No. 7,340,957: Gregory Kaduchak , Greg Goddard, Gary Salzman, **Dipen Sinha***,* John Martin, Christopher C. Kwiatkowski, Steven Graves, "Ultrasonic analyte concentration and application in flow cytometry".
23. US 7,228,740, Dipen N. Sinha, "Noninvasive characterization of a flowing multiphase fluid using ultrasonic interferometry"
24. US Pat. No. 7,114,390: David C. Lizon, Gregory Kaduchak, and **Dipen N. Sinha**, "Ultrasonic liquid level monitor".
25. US Pat. No. 6,959,601: **Dipen N. Sinha**, "Noninvasive characterization of a flowing multiphase fluid using ultrasonic interferometry".
26. US Pat. No. 6,889,560: **Dipen N. Sinha**, "Noninvasive characterization of a flowing multiphase fluid using ultrasonic interferometry".
27. US Pat. No. 6,644,119: **Dipen N. Sinha**, "Noninvasive characterization of a flowing multiphase fluid using ultrasonic interferometry".
28. US Pat. No. 6,644,118: Gregory Kaduchak and **Dipen N. Sinha**, "Cylindrical acoustic levitator/concentrator having non-circular cross-section".
29. US Pat. No. 6,467,350: Gregory Kaduchak and **Dipen N. Sinha**, "Cylindrical Acoustic Levitator/Concentrator".
30. US Pat No. 6,186,004: Greg Kaduchak and **Dipen N. Sinha**, "Apparatus and method for remote, noninvasive characterization of structures and fluids inside containers".

31. US Pat No. 6,117,089: **Dipen N. Sinha**, "Method for Noninvasive Intra-cranial Pressure Measurement".
32. US Pat. No. 6,035,041: **Dipen N. Sinha**, "Noninvasive Method for Determining the Liquid Level and Density inside of a Container".
33. US Pat. No. 5,886,262: **Dipen N. Sinha**, "Apparatus and Method for Comparing Corresponding Acoustic Resonances in Liquids".
34. U.S. Pat. No. 5,767,407: **Dipen N. Sinha**, "Noninvasive Identification of Fluids by Swept-Frequency Acoustic Interferometry".
35. U.S. Pat. No. 5,739,432: **Dipen N. Sinha**, "Ultrasonic Characterization of Single Drops of Liquids".
36. U.S. Pat. No. 5,606,130**: Dipen N. Sinha**, Brian W. Anthony, "Method for Determining the Octane Rating of Gasoline Samples by Observing Corresponding Acoustic Resonances Therein".
37. U.S. Pat. No. 5,426,977: **Dipen N. Sinha**, Roger G. Johnston, "Method for Establishing the Presence of Salmonella Bacteria in Eggs".
38. U.S. Pat. No. 5,375,595: **Dipen N. Sinha**, William O. Wray, "Apparatus and Method for Noncontact, Acoustic Resonance Determination of Intraocular Pressure".
39. U.S. Pat. No. 5,222,388: **Dipen N. Sinha**, William H. Christensen, Stephen F. Agnew, "Nitrogen Dioxide Detection".
40. U.S. Pat. No. 4,912,355: Darryl L. G. Smith, **Dipen N. Sinha**, Bruce W. Noel, "Superlattice Strain Gage".

**PUBLICATIONS AND PRESENTATIONS**

***Book:*** (Eds. Moises Levy, Dipen Sinha, and Richard Raspet) *Handbook of Elastic Properties of Solids*, Liquids, and Gases, Volume IV, Academic Press (2001); This book has found wide spread use in libraries all around the world.

**Book Chapter:** Dipen N. Sinha and Greg Kaduchak, **"**Noninvasive Determination of Sound Speed and Attenuation in Chemical Warfare Agents" in *Elastic Properties of Fluids: Liquids and Gases*, Volume IV, Chapter 1, p. 3-21, Volume Editors: Moises Levy, Dipen Sinha, and Richard Raspet, Academic Press, 2001.
***Book Chapter***: Dipen N. Sinha and Gregory Kaduchak, **"**Noninvasive Determination of Sound Speed and Attenuation in Liquids", *Modern Acoustical Techniques for the Measurement of Mechanical Properties*, Vol. 39. Academic Press, September 2001.
***Top five*** *inventions in acoustics* for the year 2005 by McGraw-Hill and Scientific American, Gregory Kaduchak, Christopher Kwiatkowski, **Dipen Sinha**, "Ultrasonic aerosol concentration and positioning", **Cover Page,** Scientific Computing & Automation, June 1998.

***Nonlinear Acoustic, Acoustic Manipulation, Collimated Acoustic Beam, Metamaterials***

- Blake T Sturtevant, Cristian Pantea, Dipen N Sinha," The acoustic nonlinearity parameter in Fluorinert up to 381 K and 13.8 MPa", J. Acoust. Soc. Am. **138** (1), July 2015, EL31
- B.T. Sturtevant, C. Pantea, D.N. Sinha, "The Acoustic Nonlinearity Parameter in

Fluorinert FC-43 up to 381 K and 13.8 MPa," *J. Acoust. Soc. Am. Express Letters* (2015), DOI: 10.1121/1.4922537.

- Christian Vanhille, Cleofe Camplos-Pozuelo, and Dipen N. Sinha, "Nonlinear frequency mixing in a resonant cavity: Numerical simulations in a bubbly liquid", Ultrasonics 54(8), November 2015, 2051-2054.
- B.T. Sturtevant, Cristian Pantea, Dipen N. Sinha, "Evaluating the Effectiveness of the Transmission Line Model in Pulse Echo Couplant Layer Corrections," *IEEE Trans. Ultrason., Ferroelect., Freq. Contr.,* Vol 60, No. 5, May 2013, pp. 943-953
- Cristian Pantea, Dipen N Sinha: "Broad-band acoustic low frequency collimated beam for ultrasonic imaging". The Journal of the Acoustical Society of America 05/2013; **133**(5):3423.
- Dipen N Sinha, Cristian Pantea: "Broadband directional ultrasound propagation using sonic crystal and nonlinear medium". The Journal of the Acoustical Society of America 05/2013; **133**(5):3461.
- Dipen N. Sinha, Cristian Pantea: "Broadband unidirectional ultrasound propagation using sonic crystal and nonlinear medium", Emerging Materials Research. 04/2013; 2(EMR3):117-126
- Cristian Pantea, Curtis F Osterhoudt, Dipen N Sinha: "Determination of acoustical nonlinear parameter β of water using the finite amplitude method", Ultrasonics
- vol. 53, no. 5, (2013), pp. 1012-1019.
- B.T. Sturtevant, Cristian Pantea, Dipen N. Sinha, "Determination of the parameter of nonlinearity in liquid water up to 250C and 14 MPa," *Proc. of 2012 IEEE Int'l Ultrason. Symp*., doi: 10.1109/ULTSYM.2012.0070.
- B.T. Sturtevant, Cristian Pantea, Dipen N. Sinha, "An Acoustic Resonance Measurement Cell for Liquid Property Determinations up to 250C ," *Rev. Sci. Instrum.* **83**, 115106 (2012); doi: 10.1063/1.4765746.
- Bart Raeymaekers, Cristian Pantea, Dipen N Sinha: "Creating a collimated ultrasound beam in highly attenuating fluids", Ultrasonics 12/2011; 52(4):564-70.
- John F Brady, Dipen N Sinha: "A multi-beam array technique for acoustical imaging", The Journal of the Acoustical Society of America 10/2011; 130(4):2411.
- F G Mitri, F H Garzon, D N Sinha: "Characterization of acoustically engineered polymer nanocomposite metamaterials using x-ray microcomputed tomography". The Review of scientific instruments 03/2011; 82(3):034903.
- F G Mitri and Dipen N Sinha: "Creating a nanocomposite metamaterial structure using the radiation force of ultrasound standing waves", 2011 IEEE INTERNATIONAL ULTRASONICS SYMPOSIUM (IUS) Pages: 1556-1558 DOI: 10.1109/ULTSYM.2011.0386 Published: 2012.
- Cristian Pantea, Dipen N. Sinha: "Acoustical filters and nonlinear acoustic wave propagation in liquids", The Journal of the Acoustical Society of America 01/2011; 129.
- F. G. Mitri, D. N. Sinha: "Metamaterial synthesis using the acoustic radiation force and characterization with x-ray microcomputed tomography". The Journal of the Acoustical

Society of America 01/2011; 129.

- Bart Raeymaekers, Cristian Pantea, Dipen N. Sinha: “Manipulating 5 nanometer diamond nanoparticles in user-defined patterns using bulk acoustic waves”. The Journal of the Acoustical Society of America 01/2011; 129.
- Bart Raeymaekers, Cristian Pantea, Dipen N. Sinha: “Manipulation of diamond nanoparticles using bulk acoustic waves”, Journal of Applied Physics 01/2011; 109(1):014317.
- Bart Raeymaekers, Cristian Pantea, Dipen Sinha: “Manipulation of diamond nano-particles using bulk acoustic waves”, The Journal of the Acoustical Society of America 10/2010; 128(4):2338.
- .Cristian Pantea, Dipen N Sinha: “Acoustical shock formation in highly nonlinear fluids”, The Journal of the Acoustical Society of America 03/2010; 127(3):1948.
- Bart Raeymaekers, Cristian Pantea, Curtis F Osterhoudt, Dipen N Sinha: “Ultrasonic imaging and characterization of objects submerged in highly attenuating fluids”, The Journal of the Acoustical Society of America 03/2010; 127(3):1845.
- Cristian Pantea, Dipen N Sinha, Curtis F Osterhoudt, Paul C Mombourquette: “Acoustic nonlinearity in fluorinert FC-43”, The Journal of the Acoustical Society of America 05/2009; 125(4):2720.
- Greg Kaduchak and Dipen N. Sinha, “Resonance Acoustic Concentration of Suspended Particles for Optical Discrimination of Aerosols”, Proceedings of the Resonance Meeting. Volume 1. Transcripts, ADPO 11293
- Gregory Kaduchak, Christopher Kwiatkowski, Dipen Sinha, "Ultrasonic aerosol concentration and positioning", in AccessScience@McGraw-Hill, http://www.accessscience.com, DOI 10.1036/1097-8542.YB050550, last modified: December 6, 2005. The technology developed here at LANL is considered one of the top five inventions in acoustics for the year!
- Gregory Kaduchak, Greg R. Goddard, Christopher S. Kwiatkowski, and Dipen N. Sinha , “Acoustic particle manipulation devices driven by resonantly excited, cylindrical structures”, J. Acoust. Soc. Am, 116(4), p. 2598, 2004
- Gregory Kaduchak, Christopher Kwiatkowski, and Dipen Sinha, “Low-power, cylindrical, air-coupled acoustic levitation concentration devices”, J. Acoustic Soc. Am., 114 (4), 2387 (2003)
- Greg Kaduchak and Dipen N. Sinha, “Ultrasonic particle concentration in a line-driven cylindrical tube,” presented at the 145th meeting of the Acoustical Society of America.
- Shulim Kogan, Greg Kaduchak, and Dipen N. Sinha, "Acoustic concentration of particles in piezoelectric tubes: Theoretical modeling of cavity shape and symmetry breaking", J. Acous. Soc. Am., 116 (41), 1967-1974 (2004).
- Greg Kaduchak, Chis Kwiatkowski, and Dipen N. Sinha, “Concentrating and Levitating Aerosols Using Sound”, presented at the 146th meeting of the Acoustical Society of America in November 2003.
- Gregory Kaduchak, Aleksandr S. Kogan, Christopher S. Kwiatkowski, and Dipen N.

Sinha,"Low-power, cylindrical, air-coupled acoustic levitation/concentration devices: Symmetry breaking of the levitation volume", .J. Acoust. Soc. Am. Volume 112, Issue 5, pp. 2242 (2002)

- Greg Kaduchak, Dipen N. Sinha, and David C. Lizon, "A novel low-cost, low-power, offthe-shelf, air-coupled acoustic levitator/concentrator", Review of Scientific Instruments, 73, 1332-1336 (2002).
- Gregory Kaduchak and Dipen N. Sinha, "Low-Power Acoustic Harvesting of Aerosols", 2001 IEEE International Ultrasonics Symposium Proceedings, 607-610 (2001).
- Gregory Kaduchak and Dipen N. Sinha," Resonance Acoustic Concentration of Suspended Particles for Optical Discrimination of Aerosols", Proceedings of the Resonance Meeting. Volume 1. (2001), Defense Technical Information Center Compilation Part Notice, ADPO 11293
- Christopher Kwiatkowski and Dipen N. Sinha, "Ultrasonic Frequency Difference Generation to Characterize Fluids in Saturated Berea Sandstone", 2001 IEEE International Ultrasonics Symposium Proceedings, 475-478 (2001).
- Greg Kaduchak and Dipen. N. Sinha, "Remote ultrasonic classification of fluids in cylindrical containers by analyzing the response of circumferential guided waves," presented at the 138th meeting of the Acoustical Society of America in November 1999 (*Invited talk*)
- G. Kaduchak and D. N. Sinha, "Resonance acoustic concentration of suspended particles for optical discrimination of aerosols," presented at the 'Resonances' meeting at the National Center for Physical Acoustics, May 1999 (published in proceedings).
- Dipen N. Sinha, G. Kaduchak, and M. J. Keleher, "Remote ultrasonic classification of fluids using the acoustic resonance characteristics of the container," presented at the 'Resonances' meeting at the National Center for Physical Acoustics, May 1999 (published in proceedings)

***Swept Frequency Acoustic Interferometry, Acoustic resonance Spectroscopy, Acoustics, NDT, Sensors and Arms Control***

- Anirban Chaudhuri, Dipen N. Sinha, Abhijit Zalte, Edurado Prereyara, Charles Webb, and Manuel E. Gonzalez, "Mass Fraction Measurements in Controlled Oil-Water Flows Using Noninvasive Ultrasonic Sensors", J. Fluid Engg., March 2014, 136, 031304
- Blake Sturtevant, Cristian Pantea, and Dipen N. Sinha, "Evaluation of the Transmission Line Model for Couplant Layer Corrections in Pulse-Echo Measurements", IEEE transactions on ultrasonics, ferroelectrics, and frequency control April 2013, 60(5):943-53 ·
- Blake Sturtevant, Dipen N Sinha: "Sound speed and frequency-dependent attenuation determination in highly attenuating lubrication fluids". The Journal of the Acoustical Society of America 11/2013; 134(5):4129.
- Anirban Chaudhuri, Dipen N Sinha: "Multiple methods for calculating ultrasonic

attenuation in liquids from non-invasive swept frequency experiments." The Journal of the Acoustical Society of America 11/2013; 134(5):4226.

- Blake Sturtevant, Cristian Pantea, Dipen Sinha: "Evaluation of the transmission line model for couplant layer corrections in pulse-echo measurements". IEEE transactions on ultrasonics, ferroelectrics, and frequency control 05/2013; 60(5):943-53.
- Blake T Sturtevant, Cristian Pantea, Dipen N Sinha: "An acoustic resonance measurement cell for liquid property determinations up to 250 °C", The Review of scientific instruments 11/2012; 83(11):115106., doi: 10.1063/1.4765746
- Blake T Sturtevant, Cristian Pantea, Dipen N Sinha: "The nonlinearity parameter, B/A, in FC-43 Fluorinert up to 373 K and 13.8 MPa". The Journal of the Acoustical Society of America 09/2012; 132(3):1995.
- Anirban Chaudhuri, Curtis F. Osterhoudt, Dipen N. Sinha: "An Algorithm for Determining Volume Fractions in Two-Phase Liquid Flows by Measuring Sound Speed", Journal of Fluids Engineering 01/2012; 134(10):101301.

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- Anirban Chaudhuri, Curtis F. Osterhoudt, Dipen N. Sinha: "Using sound speed to determine volume fractions in a two-phase flow", The Journal of the Acoustical Society of America 01/2011; 129.
- Cristian Pantea, Blake T Sturtevant, Dipen N Sinha: "Resonant ultrasound spectroscopy of sandstone", The Journal of the Acoustical Society of America 10/2010; 128(4):2453.
- Curtis F Osterhoudt, Dipen N Sinha: "Acoustical probe of the density fluctuations in a binary fluid mixture". The Journal of the Acoustical Society of America 03/2010; 127(3):2014.
- Curtis F Osterhoudt, Christopher Dudley, Dipen N Sinha: "Comparison of techniques of acoustically interrogating a fluid-filled pipe", The Journal of the Acoustical Society of America 03/2010; 127(3):1952.
- Curtis F Osterhoudt, Dipen N Sinha: "Simultaneous, noninvasive determination of fluid viscosity and density from acoustical resonances", The Journal of the Acoustical Society of America 05/2009; 125(4):2562.
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- A. Chaudhuri, D.N. Sinha, A. Zalte, E. Pereyra, C. Webb and M. Gonzalez, "Test results for mass fraction measurements in controlled oil-water flows using non-invasive acoustic sensors," SPE Journal, in press.
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127 (3), p. 1952, 2010

- Curtis F. Osterhoudt, Dipen N. Sinha, “Simultaneous, noninvasive determination of fluid viscosity and density from acoustical resonances”, J. Acoust. Soc. Am, 125(4), p. 2562,2009
- Garcia-Lopez and D.N. Sinha, “Enhanced Acoustic Separation of Oil-Water Emulsion in Resonant Cavities”, The Open Acoustics Journal, 2008, *1,* 66-71
- "All you need is Sound: Applications for acoustic resonance spectroscopy range from identifying chemical weapons to testing pharmaceutical tablets", Analytical Chemistry, October 1 2007, page 7326, Editorial article by Barry DeGrigorio about my work.
- Dipen N. Sinha and Richard Benson, “Multi-Frequency and Multi-purpose Acoustic Sensor”, Natural Gas Infrastructure Reliability Industry Forums, J. Acoustic Soc. Am., 116 (41), 1967-1974 (2004)September 16-17, 2002 - NETL Morgantown & West Virginia University - National Research Center for Coal & Energy, 2003 Conference Proceedings.
- Christopher S. Kwiatkowski and Dipen N. Sinha, “Single-transducer continuous-wave noninvasive ultrasonic characterization of fluids”, J. Acoust. Soc. Am. Volume 112, Issue 5, pp. 2440 (2002)
- Scott MacIntosh, Dipen N. Sinha, and Gregory Kaduchak, “Noninvasive Noncontact Fluid Detection in Submerged Containers Using Swept Frequency Ultrasonic Technique”, 2001 IEEE International Ultrasonics Symposium Proceedings, 689-692 (2001).
- Dipen N. Sinha and Greg Kaduchak, **“**Noninvasive Determination of Sound Speed and Attenuation in Liquids”, *Experimental Methods in the Physical Sciences*, Volume 39 (Modern Acoustical Techniques for the Measurement of Mechanical Properties). Book Chapter, Academic Press, September 2001.
- Greg Kaduchak and Dipen N. Sinha, “Effects of Diffraction on the Measurement of the Acoustic Properties of Liquids in Thin-walled Containers” by, 2000 IEEE International Ultrasonic Symposium Proceedings (October 22-25, 2000, San Juan, Puerto Rico), Vol. 1, pages 809-813.
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- Dipen. N. Sinha and G. Kaduchak, "Acoustic methods for classification of fluids in sealed containers for identification of hazardous chemicals," Presented at the 138th meeting of the Acoustical Society of America in November 1999 (*Invited talk*).
- Dipen N. Sinha, “Applications of Ultrasonic Interferometry”, Invited speaker at the Fall 1999 JASON Meeting, Washington DC.
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**TV appearance:** Good Morning America, BBC, CBS, Channel 13.

Radio talk show (CBC, Canada)

**PROFESSIONAL MEMBERSHIP**

American Physical Society
Acoustical Society of America

IEEE
Society for Brain Mapping and Therapeutics (Member of the board)