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<i>Z.W. Qian, Z. Zhu, S. Ye, W. Jiang, H. Zhu, J. Yu, Y. Yuan, Y. Yang, L. Xiao, X. Wu</i>	

<b>P2H081-03 Using Swept Frequency Acoustic Interferometry for Spherical Resonator Characteristics Determination...</b>	<b>1797</b>
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<b>P2M120-03 Ultrasonic and Optical Characterization of Forming Colloidal Films .....</b>	<b>1901</b>
<i>T. Karppinen, H. Pajari, J. Haapalainen, I. Kassamakov, E. Hæggström</i>	

<b>P2M121-04 A Simple Maxwell Based Model in Order to Represent the Frequency-Dependent Viscosity Measured by Ultrasound.....</b>	<b>1905</b>
<i>E. Franco, J. Adamowski, R. Higuti, F. Buiochi</i>	

<b>P2M122-05 Towards a Simple Acoustic Method to Evaluate the Nonlinear Parameter B/A of Fluids .....</b>	<b>1908</b>
<i>F. Vander Meulen, L. Haumesser</i>	

<b>P2M123-06 The Reflection and Transmission of Lamb Waves Across a Rectangular Crack as a Function of the Crack Geometry.....</b>	<b>1912</b>
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<i>S. Fujii, S. Kawano, T. Umeda, M. Fujioka, M. Yoda</i>	

<b>P2N127-02 Development of 4GHz Bulk Acoustic Wave Resonators by Sputtered Pb(Mn,Nb)O<sub>3</sub>-Pb(Zr,Ti)O<sub>3</sub> Thin Films .....</b>	<b>1920</b>
<i>T. Matsushima, N. Yamauchi, T. Shirai, T. Yoshihara, Y. Hayasaki, I. Kanno, K. Wasa</i>	

<b>P2N128-03 Surface Acoustic Wave Devices on AlN/Single-Crystal Diamond for High Frequency and High Performances Operation.....</b>	<b>1924</b>
<i>M. Benetti, D. Cannatà, F. Di Pietrantonio, E. Verona, S. Almaviva, G. Prestopino, C. Verona, G. Verona-Rinati</i>	

<b>P2N129-04 Single Phase Transducer Consisting of AlGaIn/GaN Film .....</b>	<b>1928</b>
<i>K. Hohkawa, S. Oshiyama, K. Koh, K. Nishimura, N. Shigekawa, Y. Terao</i>	

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<b>P2O130-01 3D Finite Element Modeling of Real Size SAW Devices and Experimental Validation .....</b>	<b>1932</b>
<i>S. Zhgoon, D. Tsimbal, A. Shvetsov, K. Bhattacharjee</i>	

<b>P2O132-03 COM Analysis for LSAW Filters .....</b>	<b>1936</b>
<i>S. Malocha, B. Abbott, N. Saldanha, A. Bayram, P.-A. Girard</i>	

## **P2P. Sensors and ID-Tags Based on SAW**

### **P2P135-01 High Frequency Lamb Wave Device Composed of LiNbO<sub>3</sub> Thin Film.....1940**

*M. Kadota, T. Ogami, K. Yamamoto, Y. Negoro, H. Tochishita*

### **P2P136-02 Feasibility of Ultra-Wideband SAW Tags .....1944**

*S. Harma, V. Plessky, X. Li*

### **P2P138-04 A Surface Acoustic Wave Sensor for Detection of Cell Adhesion .....1948**

*G. Guhr, R. Br  nig, M. J  ger, R. Poll, H. Schmidt, M. Weihnacht*

### **P2P139-05 The Effect of Parallelism of CMUT Cells on Phase Noise for Chem/bio Sensor Applications.....1951**

*H. Lee, K. Park, P. Cristman, O. Oralkan, M. Kupnik, B. (Pierre) Khuri-Yakub*

### **P2P140-06 Errors of Phase and Group Delays in SAW RFID with Phase Modulation.....1955**

*T. Han, W. Lin, J. Lin, W. Wang, H. Wu, Y. Shui, X. Du, Y. Ding, L. Cao, T. Qin*

## **P3A. Tissue Characterization - Technologies**

### **P3A023-01 Combining Edge Detection with Speckle-Tracking for Cardiac Strain Assessment in 3D Echocardiography .....1959**

*F. Orderud, G. Kiss, S. Langeland, E.W. Remme, H.G. Torp, S.I. Rabben*

### **P3A024-02 Parametric Imaging of Specular Reflections and Diffuse Scattering of Tissue from Multi-Directional Ultrasound Echo Signal Data ....1963**

*M. Vogt, J. Oprezka, H. Ermert*

### **P3A025-03 50 MHz Ultrasound Characterization of Colitis on Rats, in Vitro.....1967**

*M. Soldan, P. Silva, A. Schanaider, J. Machado*

### **P3A026-04 Ultrasound Backscattering by Three-Dimensional Distributions of Aggregated Red Blood Cells: A Monte Carlo Study .....1971**

*R.K. Saha, G. Cloutier*

### **P3A027-05 Assessment of Red Blood Cell Aggregation Using Normalized Power Spectrum of High Frequency Ultrasound.....1975**

*N. Saitoh, H. Hasegawa, H. Kanai*

### **P3A028-06 Strain Estimation with Center Frequency Correction and Reliable Displacement Selection. ....1979**

*T. Suzuki, T. Fukumoto, M. Kato*

### **P3A029-07 Biomedical Application of Acoustic Microscopy - Diagnosis, Assessing Echogenicity and Biomechanics .....1983**

*Y. Saijo, Y. Hagiwara, K. Kobayashi, N. Okada, A. Tanaka, N. Hozumi, M. Tanaka*

## **P3B. Tissue Characterization - In Vivo Applications**

### **P3B030-01 Non-Invasive Staging of Hepatic Steatosis Using Computer-Aided Ultrasound Diagnosis .....1987**

*J. Thijssen, G. Weijers, A. Starke, A. Haudum, K. Herzog, J. Rehage, C. de Korte*

### **P3B031-02 A Compound Ultrasound Imaging Strategy in Carpal Tunnel Syndrome Diagnosis.....1991**

*C.-C. Yeh, Y.-J. Yue, W.-S. Chen*

### **P3B033-04 Accurate Ultrasonic Measurement of Myocardial Regional Strain Rate at High Temporal and Spatial Resolutions .....1995**

*Y. Honjo, H. Hasegawa, H. Kanai*

### **P3B034-05 Flow-Mediated Change in Viscoelasticity of Radial Artery Noninvasively Measured by 22-MHz Ultrasound.....1999**

*K. Ikeshita, H. Hasegawa, H. Kanai*

### P3C. Elastography

<b>P3C037-01 Comparison of Multiple Beam Sequences in Arterial ARFI Imaging, Ex Vivo .....</b>	<b>2003</b>
<i>R. Behler, T. Nichols, E. Merricks, C. Gallippi</i>	

<b>P3C038-02 Acoustic Radiation Force Based Quantification of Tissue Shear Modulus Within the Region of Excitation .....</b>	<b>2009</b>
<i>M. Palmeri, D. Xuo, L. Zhai, K. Nightingale</i>	

<b>P3C039-03 A Combined ARFI Sequence for 2D Displacement Imaging and Shear Wave Velocity Mapping .....</b>	<b>2013</b>
<i>L. Zhai, S. Hsu, R. Bouchard, K. Nightingale</i>	

<b>P3C041-05 Improvement on the Elastic Visualization of Thermal Lesion Using Block Wavelet Shrinkage .....</b>	<b>2017</b>
<i>D. Zhang, M. Wan, H. Zhang, S. Wang</i>	

<b>P3C042-06 Robust Strain Estimation Using Adaptive Dynamic Grid-Interpolation Model .....</b>	<b>2021</b>
<i>M. Yamakawa, S. Bu, T. Shiina</i>	

<b>P3C043-07 Reverberation Reduction in Vibro-Acoustography Using Channel Estimation Method .....</b>	<b>2025</b>
<i>Y. Zheng, A. Yao, J. Lin, R. Kinnick, J. Greenleaf, M. Fatemi</i>	

<b>P3C044-08 Maximal Accumulative Respiration Strain for the Assessment of Hepatic Fibrosis: Preliminary Studies .....</b>	<b>2029</b>
<i>J. Shao, X. Hu, J. Wang, L. Qian, K. Liu, J. Bai</i>	

<b>P3C045-09 Computer-Aided Diagnosis of Diffuse Disease Based on Ultrasound Elasticity Images .....</b>	<b>2033</b>
<i>M. Yamazaki, H. Takizawa, T. Shiina</i>	

<b>P3C046-10 An Ultrasound Imaging Method for in Vivo Measurement of Tracheal Elasticity .....</b>	<b>2036</b>
<i>C.-Y. Chen, C.-L. Wu, S.C. Chu, H.K. Chiang</i>	

<b>P3C048-12 Quantitative Elastography, Solving the Inverse Elasticity Problem Using the Gauss-Newton Method. ....</b>	<b>2040</b>
<i>M. Sette, J. D'Hooge, H. Van Brussel, J. Vander Sloten</i>	

<b>P3C049-13 Viscoelastic Characterization of Soft Tissues by Dynamic Micro-Elastography (DME) in the Frequency Range of 300-1500 Hz .....</b>	<b>2044</b>
<i>C. Schmitt, A. Hadj Henni, G. Cloutier</i>	

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<b>P3D051-02 Cavitation Enhanced Ultrasound Thrombolysis .....</b>	<b>2052</b>
<i>S. Xu, X. Li, Y. Liu, C. Xu, M. Wan</i>	

<b>P3D052-03 A Pre-Treatment Planning Strategy for High-Intensity Focused Ultrasound (HIFU) Treatments: Optimized Source Placement .....</b>	<b>2056</b>
<i>P.J. White, B. Andre, N.J. Mcdannold, G.T. Clement</i>	

<b>P3D053-04 A Nonlinear Method for High-Intensity Focused Ultrasound (HIFU) Aberration Reduction .....</b>	<b>2059</b>
<i>P.J. White, P. Von Pattenberg, G.T. Clement</i>	

<b>P3D055-06 Contrast Agent Kinetics in the Rabbit Brain During Exposure to Focused Ultrasound .....</b>	<b>2062</b>
<i>D. Goertz, C. Wright, K. Hynynen</i>	

<b>P3D056-07 Characterization of Sonicated Breath Films by Atomic Force Microscopy .....</b>	<b>2066</b>
<i>T. Saliev, M. Mullan, Y. Cui, P. Campbell</i>	

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*S. Wong, R. Watkins, M. Kupnik, K. Butts Pauly, B.T. Khuri-Yakub*

#### **P3E058-02 Development of a Reliable Ultrasound Power Source for Metrological Applications .....2072**

*E. Alves, R. Costa-Felix*

#### **P3E059-03 A Harmonic Cancellation Technique for an Ultrasound Transducer Excited by a Switched-Mode Power Converter.....2076**

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#### **P3E060-04 A Model-Based Displacement Outlier Removal Algorithm for Ultrasonic Temperature Estimation.....2080**

*G. Ye, J.A. Noble, P. Probert Smith, C.-Y. Hsieh*

#### **P3E061-05 A Novel Ultrasonic-Imaging Based Temperature Estimation Approach by Instantaneous Frequency Detection .....2084**

*H.-L. Liu, S.-M. Huang, M.-L. Li, K.-C. Ju*

#### **P3E062-06 Thermal Imaging with Ultrasound Reflex Transmission Methods .....2088**

*C.H. Farny, G.T. Clement*

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*A. Caronti, A. Coppa, A. Savoia, C. Longo, P. Gatta, B. Mauti, A. Corbo, B. Calabrese, G. Bollino, A. Paz, G. Caliano, M. Pappalardo*

#### **P3F065-02 Dual-Electrode CMUT Optimization for CMUTs with Uniform and Non-Uniform Membranes.....2096**

*R. Guldiken, J. Zahorian, M. Balantekin, L. Degertekin*

#### **P3F066-03 The Design and Characterization of Capacitive Micromachined Ultrasonic Transducers (CMUTs) for Generating High-Intensity Ultrasound for Transmission of Directional Audio .....2100**

*I. Wygant, M. Wochner, M. Kupnik, W. Wright, M. Hamilton, B. Khuri-Yakub*

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<b>P3K102-03 Piezoelectric and Elastic Properties of SNGS and STGS Single Crystals at Elevated Temperatures .....</b>	<b>2225</b>		
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<b>P3K103-04 Leaky-SAW Properties on Reverse-Proton-Exchanged LiNbO<sub>3</sub> .....</b>	<b>2229</b>		
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