



超聲波研究室

陳永裕

大同大學 機械工程學系



研究重點

- 射頻微機電聲波元件
- 無線射頻辨識系統
- 壓電式氣體感測陣列（電子鼻）
- 壓電式微發電機
- 聲波式觸控螢幕
- 被動式無線感測系統
- 軟性電子元件之力學評估
- 超聲波非破壞檢測



重要設備

- 基礎量測儀器：
網路分析儀、示波器、電源供應器、計頻器、振動臺
- 石英晶體微天平感測系統
- 超音波非破壞檢測系統



國際合作

- 美國

Albert P. Pisano, Department of Mechanical Engineering and Berkeley Sensor and Actuator Center (BSAC), University of California, Berkeley, USA

Debbie G. Senesky, Department of Aeronautics and Astronautics, Stanford University, Stanford, USA

- 日本

Masayoshi Esashi, WPI Advanced Institute for Materials Research, Tohoku University, Japan

- 荷蘭

M. C. Elwenspoek, MESA⁺ Institute for Nanotechnology, University of Twente, Enschede, The Netherlands



研究計畫

- 採用高階藍姆波模態的氮化鋁/碳化矽板波振盪器之研究 國科會一般型研究計畫（執行期間：2013-08-01 ~ 2014-08-31）
- 結合ZnO奈米柱之可攜式表面聲波氫氣/一氧化碳感測器研製 國科會一般型研究計畫（執行期間：2013-08-01 ~ 2015-08-31）
- 無線汽車胎壓監視器系統用寬頻壓電式震動能源汲取器之研製 國科會大專學生參與專題研究計畫（執行期間：2013-07-01 ~ 2014-02-28）
- 射頻表面聲波標籤之設計與測試 力鯨科技股份有限公司產學合作案（執行期間：2013-01-01 ~ 2013-12-31）
- 寬頻氮化鋁板波震盪器之研究 國科會一般型研究計畫（執行期間：2012-08-01 ~ 2013-07-31）
- 紫外光感測模組之開發 福華電子股份有限公司產學合作案（執行期間：2011-09-01 ~ 2012-08-31）
- 表面聲波式一氧化碳感測器之研製 國科會大專學生參與專題研究計畫（執行期間：2011-07-01 ~ 2012-02-28）



研究成果 (2011-2013)

1. Yung-Yu Chen, "Lamb Wave Characteristics of Composite Plates Including a Diamond Layer with Distinct Electrode Arrangements," Japanese Journal of Applied Physics, 52, 07HB04, 2013.
2. Chia-Hao Hung, Wei-Shan Wang, Yu-Ching Lin, Ting-Wei Liu, Jia-Hong Sun, Yung-Yu Chen, Masayoshi Esashi and Tsung-Tsong Wu, "Design and fabrication of an AT-cut Quartz phononic Lamb wave resonator," Journal of Micromechanics and Microengineering, 23, 065025, 2013.
3. Yung-Yu Chen, Li-Chung Huang, Wei-Shan Wang, Yu-Ching Lin, Tsung-Tsong Wu, Jia-Hong Sun and Masayoshi Esashi, "Acoustic interference suppression of QCM sensor arrays utilizing phononic crystals," Applied Physics Letters, 102, 153514, 2013.
4. H. Yagubzade, M. Darvishi, Y.-Y. Chen, M.D. Nguyen, J.M. Dekkers, R.J. Wiegerink, M.C. Elwenspoek and N.R. Tas, "Pulsed-Laser Deposited Pb(Zr_{0.52}Ti_{0.48})O₃-on-Silicon Resonators with High-Stopband Rejection Using Feed-Through Cancellation," Applied Physics Letters, 102, 063509, 2013.
5. Chih-Ming Lin, Yung-Yu Chen, Valery V. Felmetzger, Wei-Cheng Lien, Tommi Riekkinen, Debbie G. Senesky and Albert P. Pisano, "Surface acoustic wave devices on AlN/3C-SiC/Si multilayer structures," Journal of Micromechanics and Microengineering, 23, 025019, 2013. (Selected for inclusion in IOPselect)
6. Yung-Yu Chen, Chia-Hao Yang and Rwei-Ching Chang, "Characterization of AZOY Films Deposited at Room Temperature by Radio Frequency Magnetron Sputtering," Journal of Science and Innovation, Vol. 2, No. 4, pp. 191-200, 2012.
7. Chih-Ming Lin, Yung-Yu Chen, Valery V. Felmetzger, Debbie G. Senesky and Albert P. Pisano, "AlN/3C-SiC composite plate enabling high-frequency and high-Q micromechanical resonators," Advanced Materials, 2012, 24, pp. 2722-2727, 2012. (Selected for Frontispiece)
8. Chih-Ming Lin, Yun-Ju Lai, Jin-Chen Hsu, Yung-Yu Chen, Debbie G. Senesky and Albert P. Pisano, "High-Q aluminum nitride Lamb wave resonators with biconvex edges," Applied Physics Letters, Vol. 99, 143501, 2011.
9. Yung-Yu Chen and Chih-Chieh Liu, "Sensitivity Analysis of Lateral Field Excited Acoustic Wave Gas Sensors," Japanese Journal of Applied Physics, 50, 07HD05, 2011.