

# **2015 IEEE Far East NDT New Technology & Application Forum (FENDT 2015)**

**Zhuhai, China  
28-31 May 2015**



**IEEE Catalog Number: CFP1510U-POD  
ISBN: 978-1-4673-7002-8**

**Copyright © 2015 by the Institute of Electrical and Electronic Engineers, Inc  
All Rights Reserved**

*Copyright and Reprint Permissions:* Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

***\*\*\*This publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP1510U-POD
ISBN (Print-On-Demand):	978-1-4673-7002-8
ISBN (Online):	978-1-4673-7001-1

**Additional Copies of This Publication Are Available From:**

Curran Associates, Inc  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: (845) 758-0400  
Fax: (845) 758-2633  
E-mail: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# Table of Contents

<b>P0005</b>	<b>Innovative Robotic Technology for Monitoring the Integrity of Generator Retaining Rings</b>	<b>1</b>
	<i>Mark SAVENKOV, Michael TURNER, Andres PERALTA-GORISSE</i>	
<b>P0010</b>	<b>Propagation Characteristics Analysis of Electromagnetic Acoustic Detection in Pipe</b>	<b>N/A</b>
	<i>Li-jian YANG, Jia ZHANG, Yan-hao XING, Song-wei GAO</i>	
<b>P0011</b>	<b>Effects of External Magnetic Field for Ferromagnetic Materials by Magnetic Memory Method</b>	<b>N/A</b>
	<i>Li-jian YANG, Zhe LI, Song-wei GAO</i>	
<b>P0021</b>	<b>Quantitative determination of surface cracks by the laser optoacoustic method</b>	<b>N/A</b>
	<i>Wei ZENG, Haitao WANG, Guiyun TIAN, Ruipeng GUO, Guoxing HU, Min WAN</i>	
<b>P0023</b>	<b>Dynamic analysis for pipe with an open crack</b>	<b>N/A</b>
	<i>Yu Jiang, Jia-shun Hu, Yan Liu</i>	
<b>P0024</b>	<b>Damage detection of oil and gas pipe based on metal magnetic memory technology</b>	<b>N/A</b>
	<i>Jia-shun Hu, Wen-yong Sun, Wen-cai Liu, Jian-chun Fan</i>	
<b>P0027</b>	<b>The Inspection of Wind Blades Using Thermography with Different Exciting Methods with Different Exciting Methods</b>	<b>N/A</b>
	<i>Xiao-li LI, Zhi ZENG, Jing-ling SHEN, Xun WANG, Yue-jin ZHAO</i>	
<b>P0038</b>	<b>Analysis on Crack Fatigue Growth Calculation for Nuclear Power Plant In-service Non-destructive Test Based on RSE-M</b>	<b>N/A</b>
	<i>Cheng YANG, Xue-liang ZHANG, Peng XIA, Yu-long LI</i>	
<b>P0039</b>	<b>An intelligent film evaluation technology of radiographic inspection in nuclear power plant</b>	<b>N/A</b>
	<i>Peng XIA</i>	
<b>P0053</b>	<b>PDMS Macro Development Based and Application in Pipe weld Non-Destructive Testing</b>	<b>N/A</b>
	<i>JIANG Wei-feng, HUANG Yu-xian, ZHANG Wei</i>	
<b>P0055</b>	<b>Measurement of surface damage for longitudinal acoustic waves by a laser optoacoustic technique</b>	<b>N/A</b>
	<i>Guoxing Hu, Ruipeng Guo, Haitao Wang, Wei Zeng, Xianming Yang</i>	
<b>P0061</b>	<b>Simulation and Experiment Study of Solidification Shell Thickness Non-Destructive Testing Using EMAT in Continuous Casting</b>	<b>N/A</b>
	<i>Chen Ximeng, Ouyang Qi, Zhang Xinglan, Chen Ping, Shen Zhixi, Peng Song</i>	

<b>P0064</b>	<b>Ultrasonic Signal Compressive Sampling and Its Application in Pipeline Flaw Inner Inspection</b>	<b>59</b>
	<i>Shou-peng SONG , Ying-xue LI, Yun-jiao WANG, Ying DU</i>	
<b>P0065</b>	<b>Study on Focusing Characteristics of Curved Phased Array Probe</b>	<b>63</b>
	<i>Huan-qing CAO, Zhong-bing LUO, Bo-kun ZHOU, Hui-min SU, Li LIN</i>	
<b>P0069</b>	<b>Parameter Estimation of Ultrasonic Echo Signal Based on LP and LM Algorithm</b>	<b>N/A</b>
	<i>Shou-peng SONG, Yong-hua SHAO, Zhi-you Wang, Ying-xue Li</i>	
<b>P0073</b>	<b>Electromagnetic ultrasonic tomography of plate defects based on omnidirectional Lamb-wave EMATs</b>	<b>71</b>
	<i>Lei KANG, Chao ZHANG, Ping CHEN, Jianguo LI, Yixuan ZHANG</i>	
<b>P0083</b>	<b>Service Failure Mechanism and In-Service Inspection Countermeasure for PWR RCCA Rodlets</b>	<b>N/A</b>
	<i>Yu-long Li, Xiao-hui Wei</i>	
<b>P0087</b>	<b>Implementing Ultrasonic Guided Wave Mode Control in Hollow Cylinders</b>	<b>81</b>
	<i>Xiaowei Zhang, Zhifeng Tang, Sujun Luo, Fuzai Lv, Ye Han</i>	
<b>P0089</b>	<b>The Design &amp; Implementation of Three-dimensional Analysis and Evaluation System of Sludge in Nuclear Power Evaporator</b>	<b>86</b>
	<i>Qianfei Yang, Keqing Wang, Yusu Chen, Lei Zhao</i>	
<b>P0102</b>	<b>Acoustic Emission Source Localization Method of High-speed Train Bogie</b>	<b>N/A</b>
	<i>LI Jianhui, LI Qiufeng, HE Caihou</i>	
<b>P0104</b>	<b>Application of acoustoelasticity in studying compressive stress state in Polymer bonded explosive</b>	<b>95</b>
	<i>Yao XU, Zhan-feng YANG, Hai-qiang ZHOU, Wei-bin ZHANG</i>	
<b>P0109</b>	<b>Discussion on The Technology of Inner Inspection and Acceptance Evaluation in New Oil Gas Pipeline</b>	<b>N/A</b>
	<i>Xihua MIN, Xin RAO</i>	
<b>P0111</b>	<b>SIFT-based Algorithm for Undercarriage Image of Railway Rolling Stock</b>	<b>N/A</b>
	<i>Ying-yong WU, Xiao-rong GAO, Jin-long LI, Kai YANG, Yao-hui ZHU, Shi-chao TAO</i>	
<b>P0121</b>	<b>The experimental research of low-energy impact damage of carbon fiber composite materials</b>	<b>110</b>
	<i>Guan-hua WU, E ZHOU, Ru WANG, Qi Zhang, Ting-ting Zheng</i>	
<b>P0129</b>	<b>Study of Image Fusion Algorithm to Edge erosion of Titanium Alloy with DR Detection</b>	<b>115</b>
	<i>Wu Wei, Xiang-lin Zhang, Hu Li, Guan-hua Wu</i>	
<b>P0132</b>	<b>The optimization of transducer layout in rail flaw detection</b>	<b>120</b>

Lei ZHANG, Xiao-rong GAO, Wo WANG, Chao-yong PENG

<b>P0140</b>	<b>Research on guided wave excitation mode control method of comb transducer</b>	<b>124</b>
	<i>Jun-qiang FU, Shi-yuan ZHOU, Zhe LI, Chun-guang XU, Qin-xue PAN</i>	
<b>P0146</b>	<b>Fast total focusing method by a migration approach</b>	<b>129</b>
	<i>Ewen CARCREFF, Guiyang LV, Dominique BRACONNIER</i>	
<b>P0154</b>	<b>An Investigation and Review into Microwave Thermography for NDT and SHM</b>	<b>133</b>
	<i>Ruizhen YANG, Hong ZHANG, Teng LI, Yunze HE</i>	
<b>P0155</b>	<b>A method of structural damage detection for spacecraft on orbit based on acoustic sensor array</b>	<b>N/A</b>
	<i>Lei QI, Rong-xin YAN, Li-chen SUN, Dong-hui MENG, Wei SUN, Yong WANG, Wei-dan LI</i>	
<b>P0156</b>	<b>Measurement of Residual Stresses in Materials and Welded Elements Using Ultrasonic Method</b>	<b>143</b>
	<i>J. Kleiman, Y. Kudryavtsev</i>	
<b>P0159</b>	<b>Acoustoelastic Lamb wave analysis in thin plates</b>	<b>149</b>
	<i>Ning Pei, Leonard J. Bond</i>	
<b>P0177</b>	<b>Research on the total leakage rate test of the spacecraft and its uncertainty evaluation</b>	<b>N/A</b>
	<i>Yong WANG, Guo-hua REN, Xiao-peng HONG, Zheng LI</i>	
<b>P0178</b>	<b>The ring artifact correction in cone beam CT image reconstruction</b>	<b>N/A</b>
	<i>Hui-ling HOU, Ming-quan WANG, Jun-sheng ZHANG, Xiao-peng WANG, Pei-xing CHEN</i>	
<b>P0180</b>	<b>Analysis of a kind of bipolar pulse excitation circuit</b>	<b>N/A</b>
	<i>Dingguo XIAO, Xiaohua YANG, Qinxue PAN, Xiuhua ZHANG, Chunguang XU, Fangfang LIU</i>	
<b>P0182</b>	<b>Studying of precision of ultrasonic detecting method for residual stress</b>	<b>N/A</b>
	<i>Chun-guang XU, Huan-xin LI, Qin-xue Pan, Jun-feng Wang, Ding-guo Xiao</i>	
<b>P0184</b>	<b>Reseach on the Ultrasonic Test System for the Complex Curved Surface Based on Robot</b>	<b>173</b>
	<i>Fangfang LIU, Chunguang XU, Yazhou HE, Dingguo XIAO, Fanwu MENG, Zhen XIAO, Qinxue PAN</i>	
<b>P0185</b>	<b>The research of rotary part contour measuring system based on linear CCD sensor</b>	<b>N/A</b>
	<i>Ya-zhou HE, Juan HAO, Fan-wu MENG, Chun-guang XU, Ding-guo Xiao, Fang-fang LIU, Xiao-hua Yang, Qin-xue Pan</i>	
<b>P0189</b>	<b>Analysis of Dynamic Characteristic for Ultra-thin Coating Layer with</b>	<b>182</b>

# Ultrasonic Atomic Force Microscopy

*Dong Ryul Kwak, Seung Bum Cho, Ik Keun Park*

<b>P0193</b>	<b>Research on the Weld Seam Defects Automatic Detection Based on Machine Vision</b>	<b>N/A</b>
	<i>HUANG Danping, Yu Shaodong, Tian Jianping, Hu Yong</i>	
<b>P0196</b>	<b>Research on Algorithms of Various Defects Detection of Thick-wall Pipes</b>	<b>192</b>
	<i>Liming CUI, Shiyuan ZHOU, Haoyu SUN, Qianhong LEI, Siyuan MA, Xizhi TIAN, Ping ZHANG</i>	
<b>P0198</b>	<b>Ferrite-yoke based pulsed induction thermography for cracks quantitative evaluation</b>	<b>197</b>
	<i>Yunlai Gao, Gui Yun Tian, Ping Wang, Haitao Wang, Juan Ji, Song Ding</i>	
<b>P0202</b>	<b>Identification of Rebars in a Reinforced Mash Using Eddy Current Method and Association Rule Learning</b>	<b>N/A</b>
	<i>Pawel Karol FRANKOWSKI, Ryszard SIKORA, Tomasz CHADY</i>	
<b>P0205</b>	<b>The effect of stress on the domain wall behavior of high permeability grain-oriented electrical steel</b>	<b>207</b>
	<i>Fasheng Qiu, Wenwei Ren, Gui Yun Tian, Yunlai Gao, Bin Gao</i>	
<b>P0209</b>	<b>Surface Acoustic Wave Propagation in the Variable-Thickness Complex Shape Components</b>	<b>N/A</b>
	<i>Xipeng Li, Chunguang Xu, Chao Yang</i>	
<b>P0212</b>	<b>An Investigation into Atmospheric Corrosion Detection under Paint with K-band Microwave NDT</b>	<b>218</b>
	<i>Hong ZHANG, Lin Xu, Luxiong XU, Jusheng Wu, Yunze HE</i>	
<b>P0213</b>	<b>Cross-correlation Phase Correction Method on Ultrasonic Synthetic Focused Signal Distortion</b>	<b>223</b>
	<i>Cai-qun YE, Lin LUO, Xiao-rong GAO, Li-rong JIANG, Hai-lin YUE</i>	
<b>P0214</b>	<b>Optimized Pipeline Beamformer for Ultrasound SA Imaging based on FPGA</b>	<b>N/A</b>
	<i>Chao RAN, Lin LUO, Xiao-rong GAO, Jin-long LI, Jian-ping PENG</i>	
<b>P0239</b>	<b>Research and Design of CNG Gas Well Detection System</b>	<b>236</b>
	<i>Xu Xiaodan, Guo Zhenxiang, Ren Yi, Ding Chunxiong, Wang Haitao, Zheng Kai, Song Wei, Wang Jin, Liang Zhaoming, Kong Desuo, Wu Lingyun</i>	
<b>P0241</b>	<b>Propagation of laser-generated visco-elastic Rayleigh-like waves in coatings</b>	<b>240</b>
	<i>Qing-bang HAN, Xue-ping JIANG, Jing JIA, Chang-ping ZHU</i>	
<b>P0242</b>	<b>An Adaptive Iteration Algorithm Used for Speckle Reduction Diffusion in Ultrasound Imaging</b>	<b>N/A</b>
	<i>Qiong Zhang, Bin Li, Minfen Shen</i>	
<b>P0254</b>	<b>Motion simulation of robot for nuclear reactor pressure vessel non-destructive</b>	<b>249</b>

**detection based on SoftMotion**

*Ke-qing Wang, Wen-xin Xiang, Ge Lin, Huai-dong Chen, Chun-bing Shao, Ming Li, Zhong-yuan Lin*

- P0255 Investigation on conductivity invariance in eddy current NDT and its application on magnetic permeability measurement 257**  
*Yating YU, Yu ZOU, Ming JIANG, Dejun ZHANG*
- P0257 Ultrasonic Inspection of Partially Completed Welds Using EMAT-Generated Surface Wave Technology 263**  
*Huidong Gao, Borja Lopez, Xavier Minguez, Jianbin Chen*
- P0259 Detecting non-magnetic conducting flat plates with pulsed remote eddy current field technique 267**  
*Bin-feng Yang, Hui Zhang, Chao Zhang, Hai-xia Cao*
- P0260 Ultrasonic Imaging of Corner-shaped Component with Array Probe using Full Matrix Capture N/A**  
*Na XU, Jia TANG, Yi-wei SHI, Fang-cheng HE*
- P0262 Research on Axle Press-fit Defects Detection Optimizing 277**  
*Chao-yong PENG, Xiao-rong GAO, Yang YANG, Ai WANG, Dong-dong WU, Jia-yu ZHAO*