

# **2006 33rd Conference on Computers in Cardiology**

**Valencia, Spain  
17 – 20 September 2006**

**Pages 1-480**



**IEEE Catalog Number: CFP06CAR-PRT  
ISBN 13: 978-1-4244-2532-7**

**Computers in Cardiology 2006**  
**Valencia, Spain**

**Table of Contents**

<b>1M: Rosanna Degani Young Investigator Award</b>	Chairs	P Macfarlane H Ostrow	
<hr/>			
<b>Manifestation of Left Atrial Events in the Surface Electrocardiogram during Atrial Fibrillation</b>			<b>1</b>
S Petrutiu, AV Sahakian, WG Fisher, S Swiryn			
<b>A Knowledge-Based Electrocardiogram-Monitoring System for Detection of the Onset of Nocturnal Hypoglycaemia in Type 1 Diabetic Patients</b>			<b>5</b>
C Alexakis, M Rodrigues, R Saatchi, HO Nyongesa, C Davies, RH Ireland, ND Harris, SR Heller			
<b>Computer Reconstruction of the Cardiac Pacemaker</b>			<b>9</b>
OV Aslanidi, MR Boyett, H Zhang			
<b>A Signal Abnormality Index for Arterial Blood Pressure Waveforms</b>			<b>13</b>
JX Sun, AT Reisner, RG Mark			
<b>2-1S: Diagnostic ECG</b>	Chairs	G Wagner JJ Rieta	
<hr/>			
<b>Age and Sex Dependent Criteria for Lower Limits of QRS Voltages</b>			<b>17</b>
E Clark, B Devine, PW Macfarlane			
<b>Exercise Testing for Non-Invasive Assessment of Atrial Electrophysiology in Patients with Persistent Atrial Fibrillation</b>			<b>21</b>
O Husser, D Husser, M Stridh, L Sörnmo, HU Klein, A Bollmann			
<b>Evaluation of Myocardial Damage in Chagasic Patients from the Signal-Averaged and Beat-to-Beat Analysis of the High Resolution Electrocardiogram</b>			<b>25</b>
E Laciari, R Jane, DH Brooks			
<b>Electrocardiographic Detection and Quantification of Acute Myocardial Ischemia with Dipole Modeling</b>			<b>29</b>
M Stenroos, M Lindholm, P Vesterinen, M Kylmälä, T Konttila, J Dabek, H Väänänen			

**An Automated Algorithm to Improve ECG Detection of Posterior STEMI Associated with Left Circumflex Coronary Artery Occlusion** 33  
SH Zhou, RH Startt/Selvester, X Liu, EW Hancock, E Tragardh, O Pahlm, BM Horacek, RE Gregg, ED Helfenbein, JM Lindauer

**2-2S: Models 1** Chairs B Trenor  
A Garcia-Alberola

---

**Mechanisms Underlying Cardiac Vulnerability to Electric Shocks within the Three-Dimensional Volume of the Rabbit Ventricles** 37  
T Maharaj, B Rodriguez, R Blake, NA Trayanova, DJ Gavaghan

**A Model of 3D Propagation in Discrete Cardiac Tissue** 41  
JG Stinstra, SF Roberts, JB Pormann, RS MacLeod, CS Henriquez

**Simultaneous Recovery of Three-Dimensional Myocardial Conductivity and Electrophysiological Dynamics: A Nonlinear System Approach** 45  
LW Wang, HY Zhang, PC Shi

**Estimating Conductivity Distribution of Transmural Wedges of the Ventricle Using Parallel Genetic Algorithms** 49  
DMS Martins, CR Xavier, EP Santos, VF Vieira, RS Oliveira, R Weber dos Santos

**2-3S: MRI** Chair H Engblom

---

**Improved Automated Quantification of Left Ventricular Size and Function from Cardiac Magnetic Resonance Images** 53  
C Corsi, F Veronesi, C Lamberti, V Mor-Avi

**Automatic Exclusion of Papillary Muscles and Trabeculae from Blood Volume Measurements in Cine Cardiac Magnetic Resonance Images** 57  
GLTF Hautvast, M Breeuwer, S Lobregt, FA Gerritsen

**Respiratory Gated SPAMM Sequence for Magnetic Resonance Cardiac Tagging** 61  
C Santa Marta, MJ Ledesma-Carbayo, A Bajo, E Pérez-David, A Santos, M Desco

**Cardiac Motion Analysis from Cine MR Sequences Using Non-Rigid Registration Techniques** 65  
MJ Ledesma-Carbayo, A Bajo, C Santa Marta, E Perez-David, I Caso, MA García-Fernandez, A Santos, M Desco

**Early Detection of Aortic Aneurysm Risk from 4-D MR Image Data** 69  
M Sonka, F Zhao, H Zhang, A Wahle, A Stolpen, T Scholz

**Integrating Model Based and Data Driven Approaches for the Automatic Segmentation of Cardiac Short-Axis Slice Cine MRI Recordings** 73  
A Müller, A Neitmann, M Kunze, N Merkle, M Höher, V Hombach, J Wöhrle, H Neumann, HA Kestler

**2-4S: Heart Rate Variability** Chair L Sörnmo

---

**Time Reversibility in Short-Term Heart Period Variability** 77  
A Porta, S Guzzetti, N Montano, T Gnechchi-Ruscone, R Furlan, A Malliani

**Prognostic Value of Heart Rate Variability Analysis in Patients with Depressed Left Ventricular Function Irrespective of Cardiac Rhythm** 81  
M Sosnowski, PW Macfarlane, R Parma, J Skrzypek-Wanha, M Tendera

**Power Spectrum Analysis of Heart-Rate Variability in the Young Zucker Rat** 85  
L Burattini, R Burattini, CE Cogo, E Faelli, P Ruggeri

**Activity Index from Continuous Telemetry in a Mouse Model of Voluntary Wheel Exercise Training** 89  
PE McSharry, D Adlam, JP de Bono, KM Channon

**3-1S: Nonlinear Methods in Cardiovascular Dynamics** Chair JJ Rieta

---

**Are "Scaling Patterns" Useful Tools for Exploring Fractality in Heart Rate Variability Data?** 93  
ER Bojorges-Valdez, JC Echeverria, R Valdés-Cristerna, MA Peña

**Visualisation of Heart Rate and Blood Pressure Dysregulation in Young Patients with Type 1 Diabetes Mellitus by Poincaré Plot** 97  
M Javorka, J Javorkova, I Tonhajzerova, K Javorka

**Multiscale Complexity Analysis of Heart Rate Dynamics in Heart Failure: Preliminary Findings from the MUSIC Study** 101  
M Costa, I Cygankiewicz, W Zareba, A Bayés de Luna, AL Goldberger, S Lobodzinski

**Non-Invasive Assessment of Atrioventricular Conduction Properties and Their Effects on Ventricular Response in Atrial Fibrillation** 105  
AM Climent, D Husser, J Millet, VDA Corino, L Mainardi, HU Klein, A Bollmann

**Symbolic Analysis of Short-Term Heart Period Variability during Graded Head-up Tilt** 109  
A Porta, T Gneccchi-Ruscione, E Tobaldini, S Guzzetti, R Furlan, A Malliani, N Montano

**3-2S: Three-Dimensional Imaging** Chairs E Caiani  
JG Martinez

---

**Semi-Automatic Tracking for Mitral Annulus Dynamic Analysis Using Real-Time 3D Echocardiography** 113  
F Veronesi, C Corsi, EG Caiani, L Sugeng, L Weinert, V Mor-Avi, RM Lang, C Lamberti

**Quantification of Regional Left Ventricular Function by Real-Time 3D Echocardiography: Validation by Magnetic Resonance Imaging and Clinical Utility** 117  
C Corsi, L Sugeng, HJ Nesser, L Weinert, J Niel, C Ebner, R Steringer-Mascherbauer, F Schmidt, G Schummers, RM Lang, V Mor-Avi

**Automated Assessment of Left Ventricular Wall Motion Based on Surface Detection and Color-Encoding of Real-Time Three-Dimensional Echocardiographic Images** 121  
EG Caiani, C Corsi, F Veronesi, L Weynert, L Sugeng, A Vittori, HJ Nesser, RM Lang, C Lamberti, S Cerutti

**A Framework for Real-Time Left Ventricular Tracking in 3D+T Echocardiography, Using Nonlinear Deformable Contours and Kalman Filter Based Tracking** 125  
F Orderud

**Three Dimensional Segmentation of the Heart Muscle in Real-Time 3D Echocardiographic Sequences Using Image Statistics** 129  
MM Nillesen, RGP Lopata, IH Gerrits, L Kapusta, HJ Huisman, JM Thijssen, CL de Korte

**A New Generation Image Processing Algorithm Might Enable Real-Time Visualization of 3D Echocardiographic Data on a Multi-View Auto Stereoscopic LCD** 133  
G Saracino, N Greenberg, S Fukuda, T Shiota, JD Thomas

**3-3S: Atrial Fibrillation 1** Chairs G Porenta  
P Langley

---

**Component Selection for Principal Component Analysis-Based Extraction of Atrial Fibrillation** 137  
I Romero Legarreta

**Detrended Fluctuation Analysis of Atrial Signal during Adrenergic Activation in Atrial Fibrillation** 141  
VDA Corino, F Ziglio, F Lombardi, R Sassi, LT Mainardi

**Ventricular Response during Atrial Fibrillation: Evaluation of Exercise and Flecainide Effects** 145  
VDA Corino, LT Mainardi, D Husser, HU Klein, A Bollmann

**The Equivalent Dipole Used to Characterize Atrial Fibrillation** 149  
V Jacquemet, M Lemay, A van Oosterom, L Kappenberger

**3-4S: Signal Processing 1** Chairs J Millet  
O Pahlm

---

**A Multilead Wavelet-Based ECG Delineator based on the RMS Signal** 153  
M Llamedo Soria, JP Martínez, P Laguna

**A New Mother Wavelet for Fetal Electrocardiography, to Achieve Optimal Denoising and Compressing Results** 157  
S Almagro, MM Elena, MJ Bastiaans, JM Quero

**Detecting Predisposition to Torsade De Points Using a PCA-Based Method** 161  
A Khawaja, G Butrous, O Doessel

**Heart Rate Variability during Pulse Photoplethysmography Decreased Amplitude Fluctuations and its correlation with Apneic Episodes** 165  
E Gil, MO Mendez, O Villantieri, J Mateo, JM Vergara, AM Bianchi, P Laguna

**Time-Frequency Analysis of Heart Rate Variability during Stress Testing Using "a Priori" Information of Respiratory Frequency** 169  
R Bailón, LT Mainardi, P Laguna

**Wavelet Transform and Simplicity Based Heart Murmur Segmentation** 173  
D Kumar, P Carvalho, M Antunes, J Henriques, M Maldonado, R Schmidt, J Habetha

**4-1S: Systems, Methods and Applications** Chair G Clifford

---

**Evaluation of a Nonlinear Prediction Algorithm Quantifying Regularity, Synchronization and Directionality in Short Cardiovascular Variability Series** 177  
L Faes, R Cucino, G Nollo

**Analysis of Breathing-Related Variations in ECG-Triggered Laser Doppler Perfusion Signals Measured on the Beating Heart during Surgery** 181  
C Fors, H Casimir-Ahn, K Wårdell

<b>Multi-Channel Electrocardiogram Denoising Using a Bayesian Filtering Framework</b>	<b>185</b>
R Sameni, MB Shamsollahi, C Jutten	
<b>Analysis on Dynamic Pressure-Volume (P-V) - Relations for Reliable Prediction of Chamber Remodelling in Patients with Acute Myocardial Infarction (AMI)</b>	<b>189</b>
WC Hu, CP Liu, LY Shyu, T Kao, JJ Wang	
<b>Developing Custom Signal Processing Algorithm with LabView FPGA and Compact RIO to Detect Aortic Stenosis Disease</b>	<b>193</b>
B Al-Naami, J Chebil, B Trabsheh, H Mgdob	
<b>Time-Frequency Signal Processing Approaches with Applications to Heart Sound Analysis</b>	<b>197</b>
P Raković, E Sejdić, LJ Stanković, J Jiang	
 <b>4-2S: Models 2</b>	
Chairs	J Saiz J Chorro
<hr/>	
<b>Compound Mutations in Long QT Syndrome Assessed by a Computer Model</b>	<b>201</b>
E Grandi, JL Puglisi, DM Bers, S Severi	
<b>Theoretical Investigation of Ca<sup>2+</sup> Dynamics in Normal and Hypertensive Vascular Walls</b>	<b>205</b>
A Bezerianos, A Kapela, NM Tsoukias	
<b>Effect of Lidocaine on Reentrant Ventricular Circuits in Acute Ischemic Situations. A Computer Modelling Study</b>	<b>209</b>
K Cardona, J Saiz, JM Ferrero Jr, M Martinez, G Molto, V Hernandez	
<b>Using Novel Simplified Models of Excitation for Analytic Description of Initiation, Propagation and Blockage of Excitation Waves</b>	<b>213</b>
I Idris, RD Simitev, VN Biktashev	
<b>Safety Factor in Simulated 2D Cardiac Tissue. Influence of Altered Membrane Excitability</b>	<b>217</b>
L Romero, B Trenor, JM Ferrero Jr, J Saiz, G Moltó, JM Alonso	
<b>Re-entry by Early Afterdepolarisations in a Computational Model</b>	<b>221</b>
S Scarle, RH Clayton	

**4-3S: Telemedicine**

Chairs

V Traver  
S Prucka

- 
- An Optimal Technique for ECG Noise Reduction in Real Time Applications** 225  
MM Elena, JM Quero, I Borrego
- A New Shared Care Telemedical Solution Dedicated to Elderly Patient Nursing Services for Remote GP Decision Support** 229  
D Télisson, J Fayn, J Placide, P Rubel, B Comet
- A Continuous Glucose Monitoring System in Critical Cardiac Patients in an Intensive Care Unit** 233  
A Murakami, MA Gutierrez, SHG Lage, MFS Rebelo, RHG Guiraldelli, JAF Ramirez
- Wearable Monitoring System for Heart Failure Assessment in a Mobile Environment** 237  
E Villalba, M Ottaviano, MT Arredondo, A Martinez, S Guillen
- A Prospective Multicenter Comparison Trial of Home Monitoring against Regular Follow-up in MADIT II Patients: Additional Visits and Cost Impact** 241  
CH Elsner, P Sommer, C Piorkowski, M Taborsky, H Neuser, J Bytesnik, JC Geller, H Kottkamp, H Wiesmeth, G Hindricks
- Quality Home Telemedicine Services for Chronic Cardiac Disease Patients through the INTERLIFE Platform** 245  
N Maglaveras, S Maglavera, I Lekka, I Chouvarda, V Kaimakamis, V Kilintzis, A Prentza

**4-4S: Signal Processing 2**

Chairs

J Cosin  
W Dassen

- 
- Derivation of Orthogonal Leads from the 12-Lead ECG. Accuracy of a Single Transform for the Derivation of Atrial and Ventricular Waves** 249  
MS Guillem, AV Sahakian, S Swiryn
- An Adaptive Kalman Filter for Removing Baseline Wandering in ECG Signals** 253  
MA Mneimneh, EE Yaz, MT Johnson, RJ Povinelli
- The Effect of Baseline Wandering in Automatic T-Wave Alternans Detection from Holter Recordings** 257  
L Burattini, W Zareba, R Burattini
- Quantitative Analysis of T-Wave Amplitude during Parabolic Flight** 261  
EG Caiani, C Vimercati, TD Tu, A Capderou, S Cerutti, P Vaida



**Supervised Classification Models to Detect the Presence of Old Myocardial Infarction in Body Surface Potential Maps** 265  
H Zheng, H Wang, CD Nugent, DD Finlay

**Characterization of the Magneto hydrodynamic Effect as a Signal from the Surface Electrocardiogram during Cardiac Magnetic Resonance Imaging** 269  
GM Nijm, S Swiryn, AC Larson, AV Sahakian

**5-1S: Decision Support** Chairs R Rodriguez  
A Santos

---

**A New Method of Data Preparation for Cardiological Decision Support** 273  
R Mlynarski, G Ilczuk, A Wakulicz-Deja, W Kargul

**Evaluation of Computational Classification Methods for Discriminating Human Heart Failure Etiology Based on Gene Expression Data** 277  
HY Wang, H Zheng, F Azuaje

**Cardiovascular Risk Stratification in Decision Support Systems: A Probabilistic Approach. Application to pHealth** 281  
H Atoui, J Fayn, F Gueyffier, P Rubel

**Care-Paths: Searching the Way to Implement Pathways** 285  
JC Naranjo, C Fernandez, S Pomés, B Valdivieso

**5-2S: Mechanics** Chairs A Quesada  
G Seemann

---

**Development of a Method for Determining Arterial Pulse Propagation Times and Influence of Arterial Compliance** 289  
D Zheng, J Allen, A Murray

**Blood Flow Assessment by Arterial Pressure Wave without External Calibration** 293  
SM Romano, AA Conti, C Giglioli, M Margheri, S Valente, GF Gensini, A Conti

**The End-Systolic Pressure-Volume Relation and Its Application to the Study of the Contractility of the Cardiac Muscle** 297  
RM Shoucri

**Implementation of Force Feedback into Telemanipulated Surgery: Assessment of Surgical Experience** 301  
R Bauernschmitt, EU Braun, A Knoll, H Mayer, I Nagy, R Lange

**Fully Automatic Cardiac Motion Estimation from Tagged MRI Using Non-Rigid Registration Techniques** 305  
MJ Ledesma-Carbayo, A Bajo, C Santa Marta, E Perez-David, MA Garcia-Fernandez, M Desco, A Santos

**A Computer-Controlled Pulsatile Pump System for Cardiopulmonary Bypass and Its Effects on Regional Blood Flow, Haemolysis and Inflammatory Response** 309  
M Krane, B Voss, SL Braun, H Schad, W Heimisch, R Lange, R Bauernschmitt

**5-3K: PhysioNet / CinC Challenge** Chairs G Moody  
U Steinhoff

---

**The PhysioNet / Computers in Cardiology Challenge 2006: QT Interval Measurement** 313  
GB Moody, H Koch, U Steinhoff

**A Semi-Automatic QT Interval Measurement Based on Digital Filters** 317  
CY Wu, HW Chiu

**Fully Automated Method for QT Interval Measurement in ECG** 321  
II Christov, II Simova

**Challenge 2006: QT Interval Measurement** 325  
R Schneider, A Bauer, P Barthel, G Schmidt

**Integrative Technique for the Determination of QT Interval** 329  
MA Mneimneh, RJ Povinelli, MT Johnson

**Cardiac Model Based Approach to QT Estimation** 333  
RJ Povinelli, MA Mneimneh, MT Johnson

**Individually Adaptable Automatic QT Detector** 337  
YV Chesnokov, D Nerukh, RC Glen

**Stability of QT Measurements in the PTB Database Depending on the Selected Lead** 341  
JP Martínez, R Almeida, S Olmos, AP Rocha, P Laguna

**Fully Automated Computer Measurement of QT Interval from the 12-Lead Electrocardiogram** 345  
P Langley, FE Smith, ST King, D Zheng, AJ Haigh, A Murray

**Automatic QT Interval Measurement Using a Rule-Based Gradient Method** 349  
V Chudacek, M Huptych, D Novak, L Lhotska

<b>Automated QT Interval Analysis on Diagnostic Electrocardiograms</b>	<b>353</b>
DA Tironi, R Sassi, LT Mainardi	
<b>Model-Based Determination of QT Intervals</b>	<b>357</b>
GD Clifford, M Villarroel	
<b>Identifying and Measuring Representative QT Intervals in Predominantly Non-Normal ECGs</b>	<b>361</b>
S Mensing, W Bystricky, A Safer	
<b>Algorithmic Testing for QT Interval Measurements</b>	<b>365</b>
G Bortolan	
<b>Automatic Multilead VCG Based Approach for QT Interval Measurement</b>	<b>369</b>
R Almeida, JP Martínez, AP Rocha, S Olmos, P Laguna	
<b>Reliable Automated QT Interval Measurement for Clinical Evaluation</b>	<b>373</b>
X Chen, W Xie, L Dong, ZK Tin, M Sankaranarayanan	
<b>A QT Interval Detection Algorithm Based on ECG Curve Length Transform</b>	<b>377</b>
W Zong, M Saeed, T Heldt	
<b>Automated QT Interval Measurement from Multilead ECG Signals</b>	<b>381</b>
D Hayn, A Kollmann, G Schreier	
<b>QT Interval Measurement: What Can We Really Expect?</b>	<b>385</b>
JQ Xue	
<b>5-4S: Mapping</b>	Chairs
	R Ruiz M Hoher

<b>Contributions for the Optimal Lead Placement for the Study of Atrial Fibrillation Applying Independent Component Analysis to 64 Body Surface Potential Mapping Recordings</b>	<b>389</b>
J Millet-Roig, MS Guillem, J Igual, R Llinares, R Ruiz	
<b>Feasibility of Separating the Atrial and Ventricular Components of the Electrocardiogram</b>	<b>393</b>
AJ Haigh, A Murray, P Langley	
<b>Body Surface Potential Mapping and Computer Simulation of Human Ventricular Fibrillation</b>	<b>397</b>
JR Fitz-Clarke, JL Sapp, JW Warren, JC Clements, BM Horacek	

**Epi-, Endo- and Myocardial Contributions to the Body Surface Potential** 401  
M Seger, B Pfeifer, C Hintermüller, R Modre, D Hayn, G Schreier, B Tilg

**Frequency Spectrum of the Intracardiac and Body Surface ECG during Ventricular Fibrillation - a Computer Model Study** 405  
CN Nowak, G Fischer, L Wieser, B Tilg, HU Strohmenger

**6-1S: Devices / Technology** Chairs JM Ferrero  
A Sancho-Tello

---

**Ventricular Tachyarrhythmia Onset in Patients with Implantable Cardioverter Defibrillators** 409  
A Casaleggio, P Rossi, V Malavasi, G Musso, L Oltrona

**Enhanced Integrated Format and Content Checking for Processing of SCP ECG Records** 413  
R Fischer, F Chiarugi, TK Zywiets

**Cellular Phenotype Modeling of the Long QT Syndrome Gene Supported by Distributed/Parallel Computation** 417  
C Wang, CD Nugent, A Krause, W Dubitzky

**6-2S: Cardiovascular Dynamics** Chair KA Swenne

---

**Alternans of Blood Pressure and Heart Rate in Patients with Dilated Cardiomyopathy** 421  
A Voss, R Schroeder, S Truebner, M Goernig, A Schirdewan, HR Figulla

**Risk Stratification by Autonomic Information Flow Characteristics** 425  
D Hoyer, B Frank, PK Stein, G Schmidt, R Schneider, H Schmidt

**Selective Quantification of Cardiac Sympathetic and Parasympathetic Nervous Function Based on the Heart Rate Baroreflex Impulse Response** 429  
X Chen, X Xiao, R Mukkamala

**6-3S: ECG Analysis** Chairs J Fayn  
F Castells

---

**Use of Dual Chest Leads for Deriving Complete 12-Lead/18-Lead Electrocardiograms and Vectorcardiograms in Infants** 433  
JY Wang, JW Warren, BM Horáček

<b>Optimal Electrode Placements for the Identification of Old MI and LVH</b>	<b>437</b>
MP Donnelly, CD Nugent, DD Finlay, ND Black	
<b>New Algorithm for Fetal QRS Detection in Surface Abdominal Records</b>	<b>441</b>
JF Guerrero-Martínez, M Martínez-Sober, M Bataller-Mompean, JR Magdalena-Benedito	
<b>Comparative Analysis of the Parameters Affecting AED Specificity: Pediatric vs Adult Patients</b>	<b>445</b>
E Aramendi, U Irusta, S Ruiz de Gauna, J Ruiz, JJ Gutierrez, A Bodegas, E Pastor, F Benito	
 <b>7-1P: ECG 1</b>	
<hr/>	
<b>Prediction of Supraventricular Arrhythmias in Hypertensive Patients with Different Forms of Left Ventricular Geometry</b>	<b>449</b>
A Oreziak, E Piatkowska-Janko, Z Lewandowski, G Opolski	
<b>Changes of Ventricular Repolarization in Acute Myocardial Infarction following Coronary Angioplasty</b>	<b>453</b>
G Jarusevicius, A Vainoras, L Gargasas, S Korsakas, DE Rekiene	
<b>Prediction Error Filtering for the Extraction of Abnormal Intra-QRS Potentials in Signal-Averaged Electrocardiogram</b>	<b>457</b>
CC Lin	
<b>Assessment of the Infarct Size in High-Resolution Electrocardiograms</b>	<b>461</b>
M Matveev, S Naydenov, V Krasteva, T Donova, I Christov	
<b>OpenECG: Medical Device Interoperability as a Quality Label for eHealth Services</b>	<b>465</b>
CE Chronaki, F Chiarugi, R Fischer	
<b>Adaptive Filtering for Ventricular Repolarization Variability Assessment</b>	<b>469</b>
M Altuve, S Wong, G Passariello, F Poreé, A Hernández	
<b>Algorithm Fusion for the Early Detection of Apnea-Bradycardia in Preterm Infants</b>	<b>473</b>
J Cruz, AI Hernández, S Wong, G Carrault, A Beuchee	
<b>Development of a New Non-Invasive System for Fetal Hypoxia Diagnosis</b>	<b>477</b>
J Lee, SP Cho, KJ Lee	

## 7-2P: ECG 2

---

- Adaptive Wavelet Discrimination of Muscular Noise in the ECG** 481  
P Augustyniak
- On the Use of Artificial Neural Networks in a Commercial Holter Algorithm** 485  
J Pardey
- Multiparameter Prediction Model for Atrial Fibrillation after CABG** 489  
S Sovilj, G Rajsman, R Magjarevic
- Electrocardiogram-Based Restitution Curve** 493  
A Illanes Manriquez, Q Zhang, C Medigue, Y Papelier, M Sorine
- Estimation, Analysis and Comparison of the PR and RR Intervals under Exercise Conditions and Recovery** 497  
A Cabasson, O Meste, G Blain, S Bermon
- Analysis of Voltage-Sensitive Dye Influence on ECG Segment Variability** 501  
J Bardoňová, I Provazník, M Nováková, M Blaha
- Effect of Electrocardiogram Signal Quality on T-Wave Alternans Measurements: A Simulation Study** 505  
D Janusek, M Kania, R Maniewski

## 7-3P: Ultrasonic Imaging

---

- The Assessment of Flow-Mediated Dilation (FMD) of the Brachial Artery** 509  
E Bianchini, F Fata, V Gemignani, M Giannoni, M Demi
- 2D Local Heart Motion Estimation Using Level Sets and Hierarchical B-Splines** 513  
M Mora, C Tauber, H Batatia
- EVALECHOCARD: A Database in Echocardiography for the Comparison of Methods Dedicated to the Estimation of Regional Wall Motion Abnormalities** 517  
F Frouin, N Kachenoura, A Delouche, P Dumée, T Kalikian, H Guillemet, L Sarry, O Nardi, B Diebold
- A New Method for Nearly Automated Detection of Carotid Contours on Ultrasound Images Based on Combined Region Growing and Level-Set** 521  
EG Caiani, C Corsi, P Tombolato, C Lamberti, S Cerutti

**A New Method for Single-Step Robust Post-Processing of Flow Color Doppler M-Mode Images Using Support Vector Machines** 525  
P Conde-Pardo, A Guerrero-Curienes, JL Rojo-Álvarez, R Yotti,  
J Requena-Carrión, JC Antoranz, J Bermejo

**Detection of Temporal Motion Velocity and Acceleration of Omnidirectional M-Mode Echocardiography** 529  
Q Lin, Y Lin, HY Wang, HG McAllister, H Zheng

**Using Radio Frequency Reconstructed IVUS Images in Tissue Classification** 533  
KL Caballero, J Barajas, O Pujol, J Mauri, P Radeva

#### **7-4P: Telemedicine**

---

**ASEPTIC: Aided System for Event-Based Phonocardiographic Tlediagnosis with Integrated Compression** 537  
J Martínez-Alajarín, J López-Candel, R Ruiz-Merino

**ECG Estimation Using a Saw-Tooth Pattern in Remote Environments** 541  
MM Elena, A Martín, JM Quero

**Aeneas II: A Standard for ECG Management and Exchange in the Netherlands** 545  
WA Dijk, R Hoekema, N van der Putten, WRM Dassen, ET van der Velde,  
CI Buddelmeijer, AW Huisman, AA Becht, T Maikoe

**ECG Standards for the Interoperability in Italy Patient Electronic Health Record** 549  
P Marcheschi, A Mazzarisi, S Dalmiani, A Benassi

**An Instrumentation System with Force Feedback, Automatic Recognition and Skills for Cardiac Telemanipulation** 553  
EU Braun, H Mayer, I Nagy, A Knoll, SM Wildhirt, R Lange, R Bauernschmitt

**A Fast and Simple CCU Complication Risk Registration Module for the Local Cardiology Information System (LCIS)** 557  
CI Buddelmeijer, JBA Habraken, R Adams, JJ Piek

#### **7-5P: Signal Analysis**

---

**QRST Cancellation Based on the Empirical Mode Decomposition** 561  
M Lemay, JM Vesin

<b>Real-Time Classification of Heartbeats using Least Square Acceleration Filter for Ambulatory Monitoring</b>	<b>565</b>
MH Song, KJ Lee	
<b>Relative Estimation of the Karhunen-Loève Transform Basis Functions for Detection of Ventricular Ectopic Beats</b>	<b>569</b>
G Gómez-Herrero, I Jekova, V Krasteva, I Christov, A Gotchev, K Egiazarian	
<b>Multi-Component Based Neural Network Beat Detection in Electrocardiogram Analysis</b>	<b>573</b>
T Last, CD Nugent, FJ Owens	
<b>Effect of Sigma Receptor Ligand Haloperidol on Guinea Pig Isolated Heart Electrogram</b>	<b>577</b>
M Nováková, J Bardonová, I Provazník	
<b>Passive Acoustic Maternal Abdominal Fetal Heart Rate Monitoring Using Wavelet Transform</b>	<b>581</b>
Y Song, W Xie, JF Chen, KS Phua	
<b>Computer Based Tool for Temporary and Spectral Analysis of Electrocardiographic Records</b>	<b>585</b>
A García-Sánchez, J Roca-Dorda, JL Ramón-Valencia, J Roca-González, A Monge, M Ortega	
 <b>7-6P: Arrhythmia</b>	
<hr/>	
<b>Prediction of Atrial Fibrillation Termination by Approximate Entropy in the Time-Frequency Domain</b>	<b>589</b>
C Vayá, JJ Rieta, R Alcaraz, C Sánchez, R Cervigón	
<b>Prediction of Successful Cardioversion in Atrial Fibrillation Using Wavelet Analysis Parameters and Sample Entropy</b>	<b>593</b>
R Cervigón, R Alcaraz, C Vayá, C Heneghan, J Millet, C Sánchez	
<b>Wavelet Sample Entropy: A New Approach to Predict Termination of Atrial Fibrillation</b>	<b>597</b>
R Alcaraz, C Vayá, R Cervigón, C Sánchez, JJ Rieta	
<b>Non-invasive Imaging of Atrial Flutter</b>	<b>601</b>
M Seger, R Modre, B Pfeifer, C Hintermüller, B Tilg	
<b>Analysis of Ventricular Arrhythmia Episodes in Patients at Risk for Ventricular Fibrillation</b>	<b>605</b>
M Triventi, S Valsecchi, M Landolina, M Gasparini, M Lunati, F Censi, G Calcagnini, P Bartolini	



**Development of a Pediatric ECG Rhythm Database for the Assessment of the Rhythm Analysis Algorithms of Automated External Defibrillators** 609  
U Irusta, E Aramendi, S Ruiz de Gauna, J Ruiz, JJ Gutierrez, A Bodegas, E Pastor, F Benito

**Demonstration of a Novel Catheter Guiding Method for the Ablative Therapy of Ventricular Tachycardia** 613  
ME Barley, AA Armoundas, KJ Choppy, AM Galea, GB Hirschman, RJ Cohen

**Removal of CPR Artifacts from the Ventricular Fibrillation ECG by Enhanced Adaptive Regression on Lagged Reference Signals** 617  
K Rheinberger, K Unterkofler, M Baubin, A Amann

**7-7P: Heart Rate Variability**

---

**Effects of Stroke Localization on Nonlinear Indexes of HRV** 621  
G D'Addio, A Accardo, G Corbi, G Russo, GD Pinna, N Ferrara, F Rengo

**Using the Lag of Autocorrelation Function in Order to Identify the Anaerobic Threshold during Dynamic Physical Exercise** 625  
AC Silva Filho, FMHSP Silva, FG Lima, MAS Lavrador, BC Maciel, L Gallo Jr

**Detrended Fluctuation Analysis (DFA) and R-R Interval Variability: A New Linear Segmentation Algorithm** 629  
JC Perfetto, A Ruiz, C D'Attellis

**Autonomic Nervous System Response during Coronary Occlusion Evaluated with Multiple Factor Analysis of Standard and Fractal Indexes** 633  
P Gomis, S Wong, F Ng, G Wagner

**8-1S: Systems / Baroreflex Control of Circulation** Chairs A Salvador  
S Akselrod

---

**Non-invasive Baroreflex Sensitivity Assessment in Heart Failure Patients with Frequent Episodes of Non-Sinus Rhythm** 637  
H Van de Vooren, MGJ Gademan, JCW Haest, MJ Schlij, EE Van der Wall, CA Swenne

**Improved BRS Assessment Using the Global Approach in the Sequences Technique** 641  
S Gouveia, AP Rocha, P Laguna, P van de Borne, P Lago

**Lack of Recovery of Baroreflex Function in Hypertensive Patients after Heart Surgery** 645  
R Bauernschmitt, N Wessel, H Malberg, G Brockmann, R Lange

**Exploring Causal Interactions between Blood Pressure and RR Interval at the Respiratory Frequency** 649  
R Cucino, L Faes, G Nollo

**Non-Linear Modulation of Total Peripheral Resistance Due to Pulsatility: a Model Study** 653  
F Aletti, E Lanzarone, ML Costantino, G Baselli

**8-2S: Models 3** Chairs B Rodriguez  
A Bianchi

---

**Toward Provably Correct Models of Ventricular Cell Function** 657  
RL Owen, S McKeever, J Davies, A Garfinkel

**Activity of Self-Depolarizing Pacemaker Cells Bio-Engineered in Virtual Heterogeneous Ventricular Tissue** 661  
DL Weiss, G Seemann, FB Sachse, O Doessel

**Computing the Age-Related Dysfunction of Cardiac Pacemakers** 665  
H Zhang, JH Liu, AV Holden

**The QRS-Integral of an Electrogram as an Indicator of the Subsequent Local Activation Duration** 669  
A van Oosterom, V Jacquemet

**Simulated ECG Waveforms in Long QT Syndrome Based on a Model of Human Ventricular Tissue** 673  
KQ Wang, YF Yuan, YY Tang, H Zhang

**8-3S: Coronary Imaging** Chairs M Rivera  
MJ Ledesma

---

**Statistical Descriptors of the Myocardial Perfusion in Angiographic Images** 677  
DG Gil, PR Radeva, OR Rodriguez

**IVUS Simulation Based on Histopathology** 681  
SC Groot, R Hamers, FH Post, CP Botha, N Bruining

**Reducing Cardiac Motion in IVUS Sequences** 685  
AH Hernandez, DG Gil, JM Mauri, PR Radeva

**Vessel Tortuosity Extraction from IVUS Images** 689  
D Rotger, P Radeva, O Rodriguez

**Remote Optical Stereoscopic Multispectral Imaging during Cardiac Surgery** 693  
FP Wieringa, F Mastik, DJGM Duncker, AJJC Bogers, C Zeelenberg,  
AFW van der Steen

**8-4S: Repolarization** Chairs JP Couderc  
A Murray

---

**Performance of a Continuous Real-Time QT Interval Monitoring Algorithm for the  
Critical-Care Setting** 697  
ED Helfenbein, SH Zhou, DQ Field, JM Lindauer, RE Gregg, JY Wang,  
SS Kresge, FP Michaud

**Principal Component Analysis of the T Wave: 24-Hour Monitoring of Repolarization  
Complexity in Dialysis Patients** 701  
S Severi, E Grandi, G Alessandrini, A Santoro, S Cavalcanti

**Electrocardiographic Method for Identifying Moxifloxacin-induced Ventricular  
Repolarization Abnormalities** 705  
JP Couderc, M Vaglio, X Xia, S McNitt, O Hyrien, W Zareba, AJ Moss

**T Wave Width Alterations during Valsalva Maneuver in Diabetic Patients** 709  
A Mincholé, JP Martínez, P Arini, M Risk, P Laguna

**Evolution of T Wave Width during Severe Ischemia Generated by Percutaneous  
Transluminal Coronary Angioplasty** 713  
PD Arini, JP Martinez, P Laguna

**9-1S: New Methods in Echocardiography** Chairs V Mor-Avi  
W Bencivelli

---

**Inhomogeneity of Left Ventricular Apical Rotation during the Heart Cycle  
as Determined by Ultrasound Cardiography** 717  
N Bachner, Z Friedman, W Fehske, D Adam

**Automatic Scoring of Segmental Wall Motion in Echocardiography Using  
Quantified Parametric Images** 721  
N Kachenoura, A Delouche, C Ruiz Dominguez, S Mulé, D Balvay, T Kalikian,  
A Herment, O Nardi, F Frouin, B Diebold

**Characterizing Normal and Abnormal Cardiac Echo Motion Patterns** 725  
T Syeda-Mahmood, J Yang

**4D Ultrasound Quantification of LV Function and Valvular Pathology** 729  
NL Greenberg, S Fukuda, D Agler, Y Matsumura, T Shiota, JD Thomas

**9-2S: HRV in Respiration and Sleep** Chairs P Laguna  
JP Martinez

---

**Time-Frequency Wavelet Transform Coherence of Cardio-Respiratory Signals during Exercise** 733  
K Keissar, LR Davrath, S Akselrod

**Heart Rate and Respiration Relationships as a Diagnostic Tool for Late Onset Sepsis in Sick Preterm Infants** 737  
R Loforte, G Carrault, L Mainardi, A Beuche

**Time-Variant Spectral Analysis of the Heart Rate Variability during Sleep in Healthy and Obstructive Sleep Apnoea Subjects** 741  
MO Mendez, AM Bianchi, OP Villantieri, S Cerutti, T Penzel

**Non-Parametric and Parametric Time-Frequency Analysis of Heart Rate Variability during Arousals from Sleep** 745  
MC Mantaras, MO Mendez, O Villantieri, N Montano, V Patruno, AM Bianchi, S Cerutti

**9-3S: Signal Processing 3** Chair M Stridh

---

**Analysing the Dynamics of Pulseless Electrical Activity during Cardiopulmonary Resuscitation** 749  
I Dragsund, K Gundersen, M Risdal, J Kramer-Johansen, B Abella, D Edelson, F Sterz, T Eftestøl

**Analysing Bioplar ECG Implant's Specificity to 12 Segments of Left Ventricle** 753  
J Väisänen, J Malmivuo, J Hyttinen

**ECG Arrhythmia Classification Using Simple Reconstructed Phase Space Approach** 757  
AS Al-Fahoum, AM Qasaimeh

**Quantification of Phase Recurrences in Atrioventricular (AV) Conduction during Atrial Arrhythmias** 761  
M Masè, L Glass, F Ravelli

## 10-1P: Implantable Devices

---

**Multivariate Analysis of Follow-up Physiological Data Recorded by Cardiac Implantable Devices** 765  
E Roux, AI Hernández, L Graindorge, G Carrault, P Mabo

**Considering the Effects of Circadian Rhythm May Improve Tachycardia Discrimination Performance in Implantable Cardioverter Defibrillators** 769  
J Shih, CM Mullin, S Merkel, Y Lin, S Cazares

## 10-2P: Modelling

---

**Contribution of Electrophysiological Remodeling to Generation of Re-Entries around the Right Pulmonary Veins in Human Atrium: a Simulation Study** 773  
C Tobón, J Sáiz, F Hornero, C Ruiz, V Hernández, G Molto

**Effect of Regional Ischemia in Arrhythmia Vulnerability for Heterogeneous Transmural Cardiac Wall: A Simulation Study** 777  
OA Henao, JM Ferrero Jr, J Sáiz, L Romero, G Moltó, V Hernández

**Engineering Stable Pacemaking at Physiological rate in Virtual Ventricular Myocytes** 781  
WC Tong, AV Holden

**Analytical Solution to a Minimal Cardiovascular Model** 785  
T Heldt, YB Chernyak

**A Three-Dimensional Model of Canine Cardiac Ventricular Wall Electrophysiology** 789  
AP Benson, OV Aslanidi, H Zhang, AV Holden

**The ECG T-Wave Duration as an Index of Dispersion of Ventricular Repolarization: Insights from Simulations** 793  
A Ibañez, JM Ferrero Jr

**On the Use of the Bidomain Equations for Computing the Transmembrane Potential Throughout the Heart Wall: An Inverse Problem** 797  
BF Nielsen, M Lysaker, C Tarrou, J Sundnes, X Cai, KA Mardal

## 10-3P: MRI

---

- Modeling Human Ventricular Geometry and Fiber Orientation Based on Diffusion Tensor MRI** 801  
G Seemann, DUJ Keller, DL Weiss, O Dössel
- A New Cardiac Motion Estimation Method Based on a Spatio-Temporal Frequency Approach and Hough Transform** 805  
N Carranza, G Cristóbal, MJ Ledesma-Carbayo, A Santos
- MRI in Patients with Implantable Devices: A Numerical Model for the Evaluation of Lead Heating** 809  
E Mattei, M Triventi, G Calcagnini, F Censi, P Bartolini
- A Method for Generating MRI Cardiac and Respiratory Gating Pulses Simultaneously based on Adaptive Real-Time Digital Filters** 813  
HD Park, SP Cho, KJ Lee

## 10-4P: Imaging and Informatics

---

- Multi-Object and N-D Segmentation of Cardiac MSCT Data Using SVM Classifiers and a Connectivity Algorithm** 817  
J Fleureau, M Garreau, AI Hernández, A Simon, D Boulmier
- Image Processing on Regular Coronary Angiograms for Myocardial Perfusion Measurements** 821  
H Sekiguchi, N Sugimoto, M Kawahito, JD Lee, A Nakano, M Fujita, S Eiho

## 10-5P: ECG Data

---

- The Use of Selected Diagnostic Parameters as a Feedback Modifying the ECG Interpretation** 825  
P Augustyniak
- Using the Blood Pressure Waveform to Reduce Critical False ECG Alarms** 829  
GD Clifford, A Aboukhalil, JX Sun, W Zong, BA Janz, GB Moody, RG Mark

## **10-6P: Informatics**

---

- The Mobile ECG and Motion Activity Monitoring System for Home Care Patients** 833  
S Korsakas, J Lauznis, A Vainoras, Z Markovitch, L Gargasas, I Markovitcha,  
Z Navickas, R Ruseckas
- Nocturnal Periodic Breathing Is an Independent Predictor of Cardiac Death  
and Multiple Hospital Admissions in Heart Failure** 837  
GD Pinna, R Maestri, A Mortara, P Johnson, T Witkowski, P Ponikowski,  
D Andrews, S Capomolla, MT La Rovere, P Sleight
- Remote Monitoring and Automatic Analysis of Phonocardiographic Signals in the  
Climbing of High Mountains** 841  
FC Gomez de Leon e Hijes, J Martinez Alajarin, J Lopez Candel, R Ruiz Merino,  
RL Marin Morales
- A New System for Integral Community Cardiac Rehabilitation Based on Technological  
Platforms for the Lifestyle Change Supporting System** 845  
G Giménez , J Guixeres, FJ Villaescusa, J Saiz, S Mercé, R Rodríguez, J Gomis-Tena,  
JM Ferrero Jr, MJ Sancho-Tello, V Montagud, A Salvador
- Development and Implementation of a Fully Paperless Cardiology Information System  
(EPD-Vision)** 849  
ET van der Velde, DE Atsma, MJ Schalijs, TA Witteman, H Foeken, FDB de Bruijn

## **10-7P: Cardiovascular Dynamics**

---

- Assessment of Neuro-Cardiovascular Uncoupling in Acute Brain Injury Patients** 853  
BP Papaioannou, MG Giannakou, NM Maglaveras, ES Sofianos, MG Giala
- Unexpectedly, Cluster Headache Does Not Appear to Involve a Cardiac Autonomic  
Problem, as Reflected by Continuous Wavelet Transform** 857  
LR Davrath, A Mosek, I Pinhas, S Akselrod
- Age-Dependent Response of Heart Rate Variability Parameters to Head-up Tilt  
Tests in Young Syncope Patients and Controls** 861  
C Maier, M Magerl, M Khalil, H Ulmer, H Dickhaus
- Recovery of Heart Rate Variability and Baroreflex Sensitivity following Open  
Heart Surgery** 865  
G Brockmann, N Wessel, H Malberg, R Lange, R Bauernschmitt

**Complex Demodulation of Baroreflex during Parabolic Flight** 869  
K Couckuyt, B Verheyden, F Beckers, J Liu, AE Aubert

**Estimation of Cardiac Output from Left Ventricular Pressure by a Modified Modelflow Method** 873  
S Valsecchi, GB Perego, F Censi, JJ Schreuder

**10-8P: Cardiovascular Mechanics**

---

**Characterization of Ventricular Torsion in Healthy Subjects Using Gabor Filters and a Variational Framework** 877  
J Garcia-Barnes, D Gil, J Barajas, F Carreras, S Pujadas, P Radeva

**Coronary Blood Flow: Comparison between in Vivo and Numerical Simulation Data** 881  
C De Lazzari, MG Trivella, M Micalizzi, F Bernini, M Varanini, G Ferrari, A Macerata, D Neglia, A L'Abbate

**Estimation of Cardiac Output from Left Ventricular Pressure by a Modified Modelflow Method** 885  
S Valsecchi, GB Perego, F Censi, JJ Schreuder

**Estimation of the Central Arterial Pressure Waveform and Beat-to-Beat Stroke Volume from Multiple Peripheral Arterial Pressure Waveforms** 889  
G Swamy, R Mukkamala

**Assessment of the Relationships between Blood Pressure, Pulse Wave Velocity and Digital Volume Pulse** 893  
JM Padilla, EJ Berjano, J Sáiz, L Fácila, P Díaz, S Mercé

**11M: Plenary Session** Chairs C Ferrero  
S Swiryn

---

**Peak Ectopy Rate Analysis for Risk Stratification of Sudden Death in Heart Failure** 897  
A Casaleggio, R Maestri, MT La Rovere, P Rossi, L Oltrona, GD Pinna

**Maturation of Fetal Cardiac Autonomic Control as Expressed by Fetal Heart Rate Variability** 901  
M David, M Hirsch, S Akselrod

**Detection of Heart Rate Turbulence Using an Extended IPFM Model** 905  
K Solem, P Laguna, L Sörnmo



**12-1S: Informatics** Chairs P Rubel  
R Magdalena

---

**Multilingual Enrichment of an Ontology of Cardio-Vascular Diseases** 909  
M Simonet, R Patriarche, A Bechlioulis, D Bernhard, G Diallo, R Messai, S Gedzelman

**Analysis of Xvid Video Codec for Clinical Quality Assessment in Tele-Echocardiography** 913  
R Leza, A Alesanco, P Serrano, L Ramos, A Portolés, C Aured, M García,  
C Hernández, TC Marzo, J García

**12-2S: Methods of ECG Analysis** Chair A Voss

---

**A New ECG Enhancement Algorithm for Stress ECG Tests** 917  
M Blanco-Velasco, B Weng, KE Barner

**Comparison of Alignment Algorithms for P-Wave Coherent Averaging** 921  
F Censi, G Calcagnini, M D'Alessandro, M Triventi, P Bartolini

**Spectrum Estimation and Adaptive Denoising of Electrocardiographic Signals Using Kalman Filters** 925  
LE Avendaño, CG Castellanos, JM Ferrero Jr

**Changes in Cardiac Indices from Implanted Defibrillator-Stored Electrograms Due to Acquisition and Preprocessing Conditions** 929  
J Requena-Carrión, JL Rojo-Álvarez, E Everss, F Alonso-Atienza,  
JJ Sánchez-Muñoz, M Ortiz, A García-Alberola

**12-3S: Cardiac Rhythm** Chairs H Zhang  
A Montero

---

**Characterization of Fetal Heart Rate Irregularity Using Approximate Entropy and Wavelet Filtering** 933  
F Magalhães, JP Marques de Sá, J Bernardes, D Ayres-de-Campos

**System-Identification Noise Suppression for Intra-Partum Cardiotocography to Discriminate Normal and Hypoxic Fetuses** 937  
PA Warrick, RE Kearney, D Precup, EF Hamilton

<b>Time-Domain and Morphological Descriptors of Paced and Spontaneous P-Waves in Patients Prone to Atrial Fibrillation</b>	<b>941</b>
F Censi, G Calcagnini, C Ricci, RP Ricci, M Santini, P Bartolini	
<b>The Use of Sequential RR Distributions to Detect Atrial Fibrillation Episodes in Very Long Term ECG Monitoring</b>	<b>945</b>
E Petrucci, V Balian, G Filippini, LT Mainardi	
<b>A Support Vector Machine for Predicting Spontaneous Termination of Paroxysmal Atrial Fibrillation Episodes</b>	<b>949</b>
JD Diaz, C Gonzalez, O Escalona	
<b>Propagation Velocity Kinetics and Repolarization Alternans in a Sheep Model of Pacing-Induced Atrial Fibrillation</b>	<b>953</b>
Y Prudat, JM Vesin, S Granges, P Ruchat, M Fromer, O Muller, H Abriel, L Kappenberger, P Vogt, E Pruvot	