



**5th CONFERENCE
OF THE EUROPEAN STUDY GROUP
ON CARDIOVASCULAR OSCILLATIONS**

April 7-9, 2008, Parma, Italy

Conference Hall - Don Gnocchi Foundation

Piazzale dei Servi, 3 - PARMA

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PROGRAMME



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With the endorsement of



UNIVERSITÀ DEGLI STUDI
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SICC – Italian Society
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ESGCO 2008 CONFERENCE PROGRAMME

Sunday, April 6

Late afternoon: Get-together cocktail

Monday, April 7

9:00 – 9:30 Opening

- Welcome from Local Authorities

9:30 – 10:00 A tribute to Alberto Malliani. Chair: S. Cerutti

- *B. Swynghedauw*
- *N. Montano*

10:00 – 11:00 SESSION 1 - Determinants of cardiovascular oscillations I. Chair: H. Stauss, G. Parati

- *C. Julien*, Mechanisms underlying very-low-frequency blood pressure fluctuations in conscious rats
- *A. Radaelli, P. Castiglioni, F. Cesana, G. Balestri, A.U. Ferrari, M. Di Rienzo*, Adrenergic origin of very low frequency blood pressure oscillations in the unanesthetized rat.
- *D. Seppely*, Characterization of the intercellular calcium waves arising during arterial vasomotion.
- *R. Kanbar, B. Chapuis, V. Oréa, C. Barrès, C. Julien*, Coherence analysis between spontaneous fluctuations of lumbar and renal sympathetic nerve activities in conscious rats.

Coffee break

11:30 – 12:45 SESSION 2 - Applications of non linear techniques in clinics. Chair: D. Laude

- *A. Voss, R. Schroeder, P. Caminal, I. Cygankiewicz, M. Vallverdu, R. Vázquez, M. Goernig, A. Schirdewan, H.R. Figulla, A. Bayes de Luna*, Nonlinear methods of analyzing cardiovascular oscillations contribute to risk stratification in patients with ischemic and non ischemic cardiomyopathies.
- *A. Porta, K.R. Casali, A.G. Casali, T. Gneccchi-Ruscione, E. Tobaldini, N. Montano, S. Lange, D. Geue, D. Cysarz, P. Van Leeuwen*, Short-term heart rate variability becomes irreversible in the course of pregnancy
- *D. Hoyer, R. Maestri, B. Frank, M.T. La Rovere, G.D. Pinna*, Assessment of Cardiovascular Reorganization by Autonomic Information Flow Functions
- *P. Van Leeuwen, D. Geue, M. Thiel, S. Lange, M.C. Romano, J. Kurths, D. Grönemeyer*, Fetal maternal heart rate entrainment under controlled maternal breathing
- *Y. Akay, A. Dragomire, A. Curran, M. Akay*, Complexity Measures of Respiratory Patterns during Wakefulness and Sleep after the inhibition of RVM.

Lunch & poster session P1A, P1B, P1C

14:30 – 15:30 SESSION 3 - Determinants of cardiovascular oscillations II. Chair: C. Julien, N. Montano

- *F. Barbic, A. Porta, P. Bonizzi, F. Casella, L. Diedrich, R.J. Brychta, S. Cerutti, D. Robertson, A. Diedrich, R. Furlan*, Right sided lateralization of the neural sympathetic efferent activity in humans.
- *B. Swynghedauw*, Molecular biology of circadian rhythms in 2008. A review.
- *E. Tobaldini, A. Porta, K.R. Casali, J. Francis, S.G. Wei, R. Weiss, Z.H. Zhang; R. Felder, N. Montano*, Central mineralocorticoid receptor antagonist improves autonomic cardiovascular modulation of heart rate and blood pressure variability in congestive heart failure rats.
- *J. Batzel, M. Bachar, F Kappel, D Schneditz*, Time series analysis of variations in hematocrit during hemodialysis.

Coffee break

16:00 – 17:15 SESSION 4 - Models. Chair: M. Akay, G. Baselli

- *G. Baselli, F. Aletti, F. Vallais*, Assessing Peripheral to Systemic Interactions in Cardio-Vascular Oscillations.
- *F. Cantini, M. Varanini, A. Macerata, M. Piacenti, M.A. Morales, R. Balocchi*, Phase synchronization effects of a periodically stimulated sinus node model.
- *M. Giannessi, M. Frapparelli, E. Magosso, M. Ursino*, Effect of the Central Nervous System Ischemic Response on Systemic Arterial

Pressure and Intracranial Pressure Oscillations in Patients with Severe Head Injury. A Modeling Study.

- *J.J. Żebrowski, P.Kuklik, R.Baranowski*, Relaxation oscillations in the atrium - a model.
- *N. Wessel, M. Riedl, A. Suhrbier, H. Malberg, G. Bretthauer, T. Penzel, J.Kurths*, Model-based analysis of cardiovascular regulation during sleep.

Internal meeting of ESGCO Steering Committee

Tuesday, April 8, 2008

8:30 – 9:45 SESSION 5 - Clinical applications of time and frequency domain techniques. Chair: H. Stauss

- *H. Stauss*, Impaired myogenic vascular function, leading to hemorrhagic stroke, is indicated by reduced very low frequency blood pressure variability.
- *A. Casaleggio, P. Rossi, V. Malavasi, G. Musso, L. Oltrona*, Ventricular tachyarrhythmia onset from patients with implantable cardioverter defibrillators: differences between coronary artery disease and dilated cardiomyopathies.
- *G. Gargiulo, F. Labanca, D. Lapi, R. Oliviero, E. Quarto, A. Colantuoni*, The effects of treatment with pulsating electrostatic fields on cutaneous microvascular flowmotion patterns.
- *R. Bauernschmitt, B. Retzlaff, N. Wessel, H. Malberg, R. Lange*, Surgical trauma: reason for delayed recovery of cardiovascular function after mitral surgery.
- *P. Coruzzi, P. Castiglioni, G. Parati, V. Brambilla, L. Brambilla, M. Gualerzi, F.Cademartiri, A.Franzè, G.De Angelis, M. Di Rienzo, F. Di Mario*, Autonomic cardiovascular regulation in patients with quiescent ulcerative colitis and Crohn's disease.

9:45 – 10.45 SESSION 6 - Fractal and nonlinear analysis. Chair: A. Porta, P. Castiglioni

- *K. H. Chon, S. Lu*, Is the Recommended Threshold Value r for Approximate Entropy Appropriate for All Signals?
- *J.F.Valencia, M. Vallverdu, R. Schroeder, A. Voss, I. Cygankiewicz, R. Vázquez, A. Bayés de Luna, P. Caminal*, Entropy rates based on symbolic dynamics of HRV in ischemic dilated cardiomyopathy
- *S. Cerutti*, Multivariate, multiorgan and multiscale integration of information in cardiovascular signal processing.
- *P. Castiglioni, G. Parati, M. Di Rienzo*, Aging and detrended fluctuations analysis.

Coffee break

11:15 – 12:30 SESSION 7 - Cardiovascular oscillations I: Cerebral circulation and sleep. Chair: D. Laude, N. Wessel

- *A. M. Bianchi, M. O. Mendez, S. Cerutti*, Effects of sleep macrostructure and microstructure on autonomic cardiovascular control.
- *C. Maier, V Rödler, H. Wenz, H. Dickhaus*, Is a phase-reversal phenomenon observed in inter-lead relation of beat-to-beat QRS-area series characteristic for episodes of obstructed breathing in sleep apnea patients?
- *A.Y. Schumann, A. Bauer, T. Penzel, G. Schmidt, J.W. Kantelhardt*, Cardiovascular oscillations and correlations during sleep.
- *R. Panerai*, Blood flow oscillations in the brain: contribution of arterial blood pressure and local regulatory mechanisms.
- *G.D. Mitsis, R. Zhang, B.D. Levine, E. Tzanalaridou, D. G. Katritsis and V.Z. Marmarelis*, Autonomic neural control of cerebral hemodynamics: a nonlinear study.

Lunch and poster sessions P2A, P2B, P2C, P2D

13:30 – 14:30 SESSION 8 – Devices and procedures for cardiovascular data collection. Chair: M. Di Rienzo, D. Hoyer

- *D. Cysarz, R. Zerm, H. Bettermann, M. Frühwirth, M. Moser, M. Kröz*, Agreement of respiratory rates derived from heart rate variations, ecg amplitude and nasal/oral airflow.
- *A.M. Gorbach, H. Wang, P. Smith, and E. Elster*, Assessment of vascular oscillations using infrared and laser speckle imaging.
- *K. Choy, U. Steinhoff, O. Gerdes, I. Romero*, Heart rate monitoring as a guide in direct noninvasive detection of vagus nerve activity.
- *A. Macerata, P.C. Berardi, F. Conforti, M. Micalizzi, D. Neglia, M. Varanini*, CW radar system for no-contact and remote sensing of

cardiac and respiratory movements.

14:30 – 15:30 SESSION 9 – Cardiovascular oscillations II: Control in altered gravity. Chair: R. Panerai, - B. Swynghedauw

- A. E. Aubert, B. Verheyden, K. Couckuyt, J. Liu, Autonomic cardiovascular control after short and long duration spaceflight.
- M. Di Rienzo, P. Meriggi, F. Rizzo, A. Faini, P. Castiglioni, A. Guadagno, G. Parati, Autonomic control of the heart in altered gravity conditions: monitoring and quantification.
- P.F. Migeotte, N. Pattyn, R. Vanspauwen, X. Neyt, M. Acheroy, P. Van de Heyning, F. Wuyts, Respiratory Sinus Arrhythmia on the ESA-short arm human centrifuge: a comparison of hypergravity vs microgravity influences on cardiorespiratory interactions.
- R.M. Baevsky, I.I. Funtova, E.S. Luchitskaya, J. Tank, Investigation of the cardiovascular system autonomic regulation aboard international space station.

16:00 – 22:00 Social event and dinner for all participants

Wednesday, April 9, 2008

9:00 – 10:15 SESSION 10 – Heart rate and QT variabilities. Chair: A. Voss, S. Cerutti

- Hagen Malberg, Robert Bauernschmitt, Andreas Voss, Thomas Walther, Renaldo Faber, Holger Stepan, Niels Wessel, Prediction of hypertensive disorders in pregnancy.
- M. Baumert, G. W. Lambert, T. Dawood, E. A Lambert, M. D. Esler, M. McGrance, D. Barton, D. Abbott, E. Nalivaiko, QT interval variability during rest is not correlated with cardiac noradrenaline spillover in patients with depression and panic disorder.
- J. Halámek, P. Jurák, M. Villa, P. Fráňa, M. Souček, P. Leinveber, V. Vondra, V.K. Somers, T. Kara, QT hysteresis.
- G.D. Pinna, R. Maestri, M.T. La Rovere, L. Danilowicz-Szymanowicz, G. Raczak, The variability of heart rate variability: dealing with the consistency of measured parameters.
- J.P. Couderc, The Telemetric and Holter ECG Warehouse.

10:15 – 11:15 SESSION 11 - Cardiorespiratory interaction. Chair: P. Coruzzi, A. Aubert

- G. Parati, G. Bilo, G. Caldara, S. Boarin, P. Castiglioni, M. Di Rienzo, Effects of slow breathing training on cardiovascular regulation and clinical parameters. A novel non pharmacological approach?
- T.C. Lopes, A. Beda, P.C.N. Granja-Filho, F.C. Jandre, A. Giannella-Neto, Does Respiratory Sinus Arrhythmia imply privileged locations for the occurrence of the heartbeats within the respiratory cycle?
- M. Masè, F. Ravelli, Respiratory mechanical modulation of atrial and ventricular intervals during atrial flutter.
- T. Krauze, P. Guzik, J. Piskorski, A. Wykretowicz, H. Wysocki, Duration of inspiration and expiration during slow breathing affects autonomic modulation of cardiovascular system.

Coffee break

11:30 – 13:00 SESSION 12 – Baroreflex function. Chair: G. Parati,

- D. Laude, V. Baudrie, J.L. Elghozi, Blood pressure variability and baroreflex in mice.
- G. Nollo, L. Faes, M. Masè, C. Gasperi, F. Ravelli, A. Cevese, Low frequency cardiovascular oscillations investigated by causal cross-spectral analysis during α -blockade in healthy humans.
- A. Beda, D. M. Simpson, Estimating baroreflex sensitivity in individual recordings: predicting errors in estimates from parametric models.
- D. Bajic, S. Stojcic, O. Sarenac, T. Loncar-Turukalo, T. Bojic, N. Japundzic-Zigon, Temporal analysis of spontaneous baroreceptor reflex during emotional stress in freely moving rats.
- K. Keissar, R. Maestri, G. D. Pinna, M. T. La Rovere, S. Akselrod, Enhanced non-invasive baroreflex sensitivity assessment using Wavelet Transfer Function (WTF).
- M. Gujic, D. Laude, A. Houssière, S. Beloka, J.F. Argacha, D. Adamopoulos, O. Xhaët, J.L. Elghozi, P. Van De Borne, Differential effects of metaboreceptor and chemoreceptor activation on sympathetic and cardiac baroreflex control following exercise in hypoxia in humans.

Closing remarks

POSTER PRESENTATIONS

April 7 12:45 – 14:30

SESSION P1A - Determinants of CV oscillations

- 1 *N. Honzikova, B. Fiser, Z. Novakova, E. Zavodna, H. Hrstkova, K. Krontoradova, J. Stastna, P. Honzik* - A late effect of an anthracycline therapy on 24-hour profile of blood pressure
- 2 *P.Jurak, J.Halamek, V.Vondra, P.Leinveber, P.Frana, M.Plachy, M.Soucek and T.Kara* - Vessel elasticity estimation from non-invasive continual blood pressure measurements
- 3 *N. Pattyn; P.F. Migeotte ; X. Neyt ; R. Cluydts* - Differentiation of a tonic and a phasic component to cardio-respiratory stress reactivity
- 4 *D. Lapi, S. Vagnani, P.L. Marchiafava, A. Colantuoni* - Rhythmic diameter changes in rat pial arterioles after the transient occlusion of middle cerebral artery

SESSION P1B – Methods

- 5 *S. Vandeput, B. Verheyden, A.E. Aubert, S. Van Huffel* - Numerical Noise Titration analysis applied to Holter Recordings of a Large Healthy Population
- 6 *M.I. Yabluchanskiy, A.V. Martynenko* - Our team HRV interpretation philosophy
- 7 *M. Vaglio, A. Porta, P. Pizzinelli, S. Di Marco, D. Lucini, F. Badilini, M. Pagani* - A Fully Automatic Algorithm for the Analysis of Heart Rate Changes and Cardiac Recovery during Exercise
- 8 *L. Burattini, W. Zareba, R. Burattini* - Comparison of Adaptive Match Filter vs. Correlation Method to Detect and Characterize ECG T-Wave Alternans in Clinics
- 9 *I. Višćor, J. Halámek, V. Vondral* - Complex bioimpedance signals in cardiology
- 10 *A. Martynenko, M. Yabluchansky* – Spectral independent component analysis of heart rate variability
- 11 *R. Sepehr, M.H. Moradi, G. Mashayekhy* - Comparison of different methods for deriving the respiration signal from 1 lead ECG signal and its application to detection of Sleep Apnea
- 12 *R.M. Baevsky, V.V. Bogomolov, A.G. Chernikova, I.I. Funtova, E.S. Luchitskaya* – Scientific experiment “SONOCARD” aboard the International Space Station
- 13 *M. O. Mendez, E. Gil, J. M. Vergara, S. Cerutti, A. M. Bianchi, P. Laguna* - Relationship among Envelope Fluctuations in PPG, HRV and apnea
- 14 *S. Krimi, K. Ouni and N. Ellouze* - A multi-scale product wavelet decomposition based classifier of the electrocardiogram
- 15 *M. Di Rienzo, F. Rizzo, P. Meriggi, P. Castiglioni, G. Parati, M. Ferratini* - Textile technology and embedded intelligence for online monitoring of cardiorespiratory functions

SESSION P1C – Nonlinear and complex analysis

- 16 *J.E. Pérez, L. Solis, J.C. Echeverría, R. González-Camarena, R. Rivera, M.C. Sánchez* - Repeatability of heart rate variability in congenital hypothyroidism as analysed by detrended fluctuation analysis
- 17 *R. Sassi, L. Mainardi* - On the effects of editing RR series for following analysis with nonlinear statistics
- 18 *J. Marczyk, A. Dello Russo, G. Pelargonio, M. Casella, F. Accardi, G. Raciti, P. Zecchi* – Baseline heart rate related complexity index in heart failure patients predict clinical response to cardiac resynchronization

therapy

- 19 *L. Faes, H. Zhao, K. H. Chon, G. Nollo* - A method to assess non linear dynamics in non stationary time series based on time-varying surrogate data
- 20 *J.F.Valencia, M. Vallverdu, R. Schroeder, A. Voss, I. Cygankiewicz, R. Vázquez, A. Bayés de Luna, P. Caminal* - Characterization of HRV by detrended fluctuation analysis in ischemic dilated cardiomyopathy
- 21 *M. Javorka, Z. Trunkvalterova, I. Tonhajzerova, K. Javorka* - Recurrence quantification analysis of heart rate dysregulation in patients with Type 1 diabetes mellitus
- 22 **P. Guzik, J. Piskorski, T. Krauze, A. Wykretowicz, H. Wysocki** - Blood pressure asymmetry by Poincaré plots
- 23 *P. Guzik, J. Piskorski, T. Krauze, A. Wykretowicz, H. Wysocki* - Partitioning total heart rate variability by Poincaré plots
- 24 *S. Zurek, J. Piskorski, P. Guziki* - Stability of the correlation dimension algorithm suggests the existence of an invariant measure in the embedding space of the RR time series
- 25 *Z. Trunkvalterova, M. Javorka, I. Tonhajzerova, K. Javorka* - Multiscale entropy of cardiovascular oscillations in young diabetics
- 26 *V.D.A. Corino, C. Albuquerque, D. Husser, A. Bollmann, L.T. Mainardi* - Analysis of ventricular response during stress test in atrial fibrillation: a multiscale entropy approach
- 27 *E. Santarcangelo, R. Balocchi, G. Paoletti, C. Palombo, C. Morizzo, G. Carli, M. Varanini* - Hypnotizability-related complexity of heart rate variability during long lasting relaxation
- 28 *T.H. Tarkiainen, T. Hakala, A. Hedman, E. Vanninen* - Non-sinus beats strongly affect short-term non-linear heart rate dynamics
- 29 *S. Chalavi, M. Hassan Moradi* - Detecting Nonlinearity and Chaos in Heart Rate Variability (HRV) Series of Healthy Persons and AF Patients
- 30 *K.R. Casali, A.G. Casali, N. Montano, M.C. Irigoyen, E. Tobaldini, T. Gnechchi-Ruscione, A. Porta* - Assessment of heart rate irreversibility induced by graded sympathetic activation in humans
- 31 *P. Cipriani, S. Comani, M.T. Di Bari* - Nonlinear dynamics of fetal magnetocardiographic signals

April 8 12:30 – 13:30

SESSION P2A – Clinical aspects

- 32 *V. Conte, S. Guzzetti, A. Porta, E. Tobaldini, P. Baratta, L. Bello, N. Stocchetti* - Cardiovascular oscillations during awake and asleep craniotomy
- 33 *P. Leinveber, M. Orban, P. A. Brady, S. M. Caples, T. Konecny, P. Jurak, S.J. Offutt, S.R. Ommen, V.K. Somers* - Variability of Parameters from Overnight Pulse Oximetry in Patients with Hypertrophic Cardiomyopathy
- 34 *S. Kletskin, G. Barshtein* - Heart rate variability is a key for assessment of anesthesia adequacy
- 35 *U. Schneider, B. Schröder, M. Liehr, E. Schleussner, D. Hoyer* - The effect of antenatal steroid treatment for premature lung maturation on fetal autonomic heart rate regulation revealed by fetal magnetocardiography (fMCG)

SESSION P2B – Oscillations in physiological conditions

- 36 *M.G. Frasch, A.P. Prout, M. Szynkaruk, M.G. Ross, R. Gagnon, B.S. Richardson* - Measures of vagal modulation of fetal heart rate variability correlate to the levels of pro-inflammatory cytokine IL-1beta and IL-6 in pre-term fetal sheep: Evidence of a neuroimmunological link?
- 37 *F. Cottin, C. Médigue, Y. Papelier* - Effect of exercise induced hyperpnea on cardiovascular parameters variability in healthy humans

- 38 *V. Magagnin, E.G. Caiani, L. Fusini, I. Bo, F. Molteni, M. Turiel, V. Licari, S. Cerutti, A. Porta* - Evaluation of the Autonomic Nervous System Response During Treadmill Training with Assistance of a Robot-Driven Gait Orthosis
- 39 *V. Magagnin, E.G. Caiani, L. Fusini, I. Bo, M. Turiel, V. Licari, S. Cerutti, A. Porta* - Body-weight-supported technique exploited in automated locomotor training with driven-gait orthosis produces a light sympathetic activation compared to stand
- 40 *B. Verheyden, K. Couckuyt, J. Liu, A.E. Aubert* - Respiratory modulation and baroreflex control of heart rate in space
- 41 *K. Couckuyt, B. Verheyden, J. Liu, A.E. Aubert* - Autonomic Recovery after Long-duration Spaceflight
- 42 *S. Lange, P. Van Leeuwen, D. Geue, U. Schneider, B. Frank, D. Hoyer, W. Hatzmann, D. Grönemeyer* - Heart rate features in fetal behavioural states
- 43 *C. Cammarota, M. Curione* - Variability of RR intervals and QRS complex area during exercise stress test
- 44 *Y. Papelier, F. Cottin, C. Médigue, O. Nicoli* - Comparative analysis of the variabilities of myocardial action potential duration (APD) and diastolic interval (DI) during two different types of exercise.

SESSION P2C – Respiration and Baroreflex

- 45 *P.C.N.Granja-Filho, F.C.Jandre, A.Beda, A.Giannella-Neto* - Effects of the Inspiratory to Expiratory Time Ratio on the Mean Pattern of the Respiratory Sinus Arrhythmia
- 46 *N. C. Carvalho, A. Beda, F.C. Jandre, A. Giannella-Neto* - Comparison of different methods to characterize the pattern of respiratory sinus arrhythmia during mechanical ventilation
- 47 *B. Fiser, N. Honzikova, J. Zicha, Z. Dobesova, J. Kunes* - Baroreflex sensitivity in Wistar-Kyoto and spontaneously hypertensive rats
- 48 *D. Cysarz, D. von Bonin, P. Brachmann, S. Buetler, K. Laederach-Hofmann, P. Heusser* - Circadian variation of the correlation between cardiorespiratory coordination and heart rate variability
- 49 *D. Cysarz, D. Geue, S. Lange, D. Grönemeyer, P. Van Leeuwen* - Does paced maternal breathing lead to changes of fetal heart rate dynamics?
- 50 *J. Piskorski, P. Guzik*, T. Krauze* - Revealing cardiovascular resonance during paced breathing at 0.1 Hz
- 51 *P. Guzik, J. Piskorski, T. Krauze, A. Wykretowicz, H. Wysocki* - Evaluation of baroreflex sensitivity by analysis of Poincaré plots of cardiac cycles and blood pressure signals
- 52 *A. Van de Louw, C. Médigue, Y. Papelier, F. Cottin* - Respiratory sinus arrhythmia and baroreflex loop in hypoxemic mechanically ventilated patients.
- 53 *N. Janson, S. Rzczinski, A. G. Balanov, and P. V. E. McClintock* - Synchronizing heart rhythm by paced breathing

SESSION P2D - Models

- 54 *R. Sauser, M. Koenigsberger, D. Seppey* - A theoretical and experimental study of vasomotion: influence of the endothelium
- 55 *T. Buchner, J.J. Żebrowski, G.Gielerak, M. Grzęda* - Dynamics of breathing-related blood pressure and heart rate variability during head up tilt test: analysis of experimental data and a “kicked Windkessel” model
- 56 *K. Thomaseth* - A comparative analysis of competing Windkessel models in the characterization of peripheral vascular impedance by means of non-invasive blood pressure measurements
- 57 *F. Aletti, X. Chen, R.L. Hammond, J.A. Sala-Mercado, D.S. O’Leary, G. Baselli, R. Mukkamala* - Analysis of Linear Cardiac Output Contributions to Beat-to-Beat Arterial Blood Pressure Variability



Fondazione Don Carlo Gnocchi Onlus

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