

CMMNO-2014

4th International Conference on
Condition Monitoring of Machinery in
Non-stationary Operations

PROGRAM

Crédit photo : Maia Eolis

Topics

- Noise and vibration
- Condition monitoring
- Non-stationary operations
- Signal processing
- Pattern recognition
- Modelling of dynamics and fault
- Mechatronic machinery
- Industrial Contest

Lyon - France
15th & 16th December 2014

добродошао

sambutan

bienvenida

Fáilte

tervetuloa

dobrodošli

bienvenue

karşılama

powitanie

benvenuto

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Ласкаво просимо

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Benvido

Velkommen

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Chào mừng

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Vitajte

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Croeso

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ברוכים הבאים

Сардэчна запрашаем

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καλωσόρισμα

velkomnir

Forewords

Welcome to Lyon for this 4th issue of the CMMNO conference which previously took place in Ferrara (Italy) in 2013, Hammamet (Tunisia) in 2012, and Wroclaw (Poland) in 2011. As explicated by its name, the conference on Condition Monitoring of Machinery in Non-Stationary Operations brings together high-level research works on a topic that currently represents an important challenge in the field of condition monitoring. For almost 50 years, it has been assumed that operating conditions are constant and reproducible, more because it has been a necessary simplification than as a realistic postulation. Such a working assumption obviously places strong limitations to the range of applications that can be tackled with classical tools; some typical examples that cannot content themselves with this assumption and require fundamentally new approaches are given by planes, cars or wind turbines which operate most of the time under nonstationary regimes.

The objective of this conference is to present the latest research results devoted to extending the scale of applicability of condition monitoring to non-stationary operating conditions or non-steady environments. The received contributions constitute all together the current state-of-the-art on the topic: they reveal a rich variety of ideas, ranging from the introduction of new types of measurements, new data processing algorithms, and generalisation of existing theories. Contributors come from 18 different countries (Algeria, Australia, Belgium, Colombia, Canada, France, Italy, Lebanon, Morocco, Poland, Russia, Saudi Arabia, Slovenia, Spain, Sweden, Tunisia, UK, USA) and from both the industry and academic institutions, which augurs many fruitful exchanges.

Have a great conference!

Committees

Organising Committee

LASPI, Université de Lyon, UJM St-Etienne, France

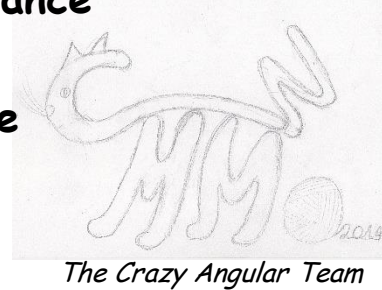
M. El Badaoui, C. Corbier, E. Downs, F. Guillet

LaMCoS, Université de Lyon, INSA-Lyon, France

Z. Achoui, A. Bourdon, K. Gryllias, D. Remond

LVA, Université de Lyon, INSA-Lyon, France

J. Antoni, F. Girardin, Q. Leclere



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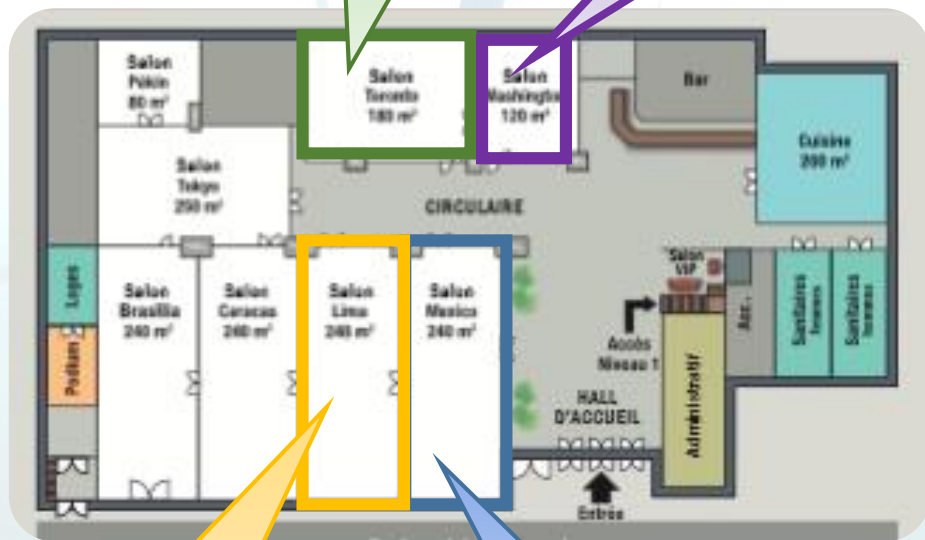
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Toronto :
Parallel session

Washington :
Working room



Lima :
Plenary & parallel
sessions

Mexico
Breaks & Posters



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Please ask the reception

Schedule

Monday 15th

8h	Registration & Coffee	
9h	Welcome plenary session	
9h30	Keynote Lecture	
10h15	Coffee Break	
10h45	Nonstationary (cyclostationary) signal processing	Condition Monitoring
12h20	Lunch & Poster session	
13h50	Keynote Lecture	
14h35	Instantaneous Angular Speed	Data mining & Pattern recognition
15h55	Coffee Break	
16h25	Signal processing for diagnostics	Signal modelling
17h45	Presentation of the contest results	
20h	Dining Cruise	

Tuesday 16th

Keynote Lecture		9h
Coffee Break		9h40
Diagnostics under nonstationary conditions	Model identification & modal analysis	10h20
Lunch		12h
Keynote Lecture		13h30
Signal Processing : nonstationary and IAS tracking	Modelling	14h15
Coffee Break		15h55
Signal processing for diagnostics	Vibration analysis	16h25

Room : Lima

Room : Toronto

Room : Mexico

Posters

Room : Mexico

Gear fault diagnosis based on Angular Measurements and Support Vector Machines in normal and non-stationary conditions

Fedala S.,
Rémond D.,
Zegadi R.,
Felkaoui A.

Modelling and simulation of gear systems dynamic for supporting condition monitoring using Mathematica

Grabski J.,
Bartelmus W.

Detection of gear faults in variable rotating speed using EEMD decomposition and instantaneous frequency

Mahgoun H.,
Felkaoui A.,
Fedala S.,
Chaari F.

Blind Source Separation using Single-Channel Vibration Signals for Fault Detection in Rotating Machines,

Cardona-Morales O.,
Aguirre-Echeverry C.,
Castellanos-Dominguez G.

Blind Extraction of Instantaneous Frequency for Order Tracking in Rotating Machines under Non-Stationary Operating Conditions

Cardona-Morales O.,
Sierra-Alonso E.,
Castellanos-Dominguez G.

On Development of a Test Rig for Research in Drivetrain Diagnostics / Prognostics

Ganeriwala S.

A Novel Test Rig for Research & Education in Wind Turbine Technology & Diagnostics / Prognostics

Ganeriwala S.

*Enjoy them
during lunches &
coffee breaks*

Room : Lima

Room : Mexico

Room : Toronto

Monday

8h

Registration & Coffee

9h

Welcome plenary session

9h30

Keynote Lecture - Session Chair: R. Randall

Patrick Flandrin: *Data-driven time-frequency analyses*

10h15

Coffee Break

Nonstationary (cyclostationary) signal processing
Session Chair: D'Elia G.

Condition Monitoring
Session Chair: Zimroz R.

Use of cyclostationary analysis for rust detection on the hub of heavy duty wheels.
Mucchi E., D'Elia G., Dalpiaz G.

11h00

Using SCADA data for fault detection in wind turbines: local internal model vs distance to a wind farm reference.
Lebranchu A., Charbonnier S., Bérenguer C., Prevost F.

Angle-Time cyclostationarity in rolling element bearing vibrations.
Eltabach M., Antoni J., Sieg_zieba S., Abboud D.

11h20

Conditional machine monitoring: relevance of the Octagram to characterize the vibratory status of a whole machinery ? interest of pattern trackers ?
Vasselin J., Thomas X., Lozia J.

Study of the cyclostationary nature of photovoltaic panels and meteorological signals.
Telidjane M., Bonnardot F., El Badaoui M., Marrakchi G.

11h40

Diagnostic features modeling for decision boundaries calculation for maintenance of gearboxes used in belt conveyor system.
Stefaniak P., Wylomanska A., Zimroz R., Bartelmus W., Hardygora M.

Modeling of squirrel cage induction machine with fault bars
Ouachtouk I., Elhani S., Guedira S.

12h00

On optimal threshold selection for condition monitoring
Kocare N., Juricic D., Boskoski P.

12h20

Lunch & Posters session

15th december

13h50

Keynote Lecture - Session Chair: Barszcz T.

Michael Feldman

Hilbert Transform: from fundamentals to some applications

Instantaneous Angular Speed

Session Chair: André H.

Data mining & Pattern recognition

Session Chair: Garibaldi L.

Correction algorithm for zebra tapes with multiple butt joints.

Janssens K., Bianciardi F., Pezzola M., Palermo A., Britte L.

14h35

Output-Only Modal Analysis using IFESIS.
Gryllias K., Viakopoulos C., Antoniadis I.

Evaluation and improvement of accuracy in the Instantaneous Angular Speed (IAS) and Torsional Vibration measurement using zebra tapes.

Palermo A., Janssens K., Britte L.

14h55

Model-based identification of elevator rail friction.
Esteban E., Salgado O., Iturrospe A., Isasa I.

Electrical Induction Motor Higher Harmonics Analysis based on Instantaneous Angular Speed Measurement.

Spagnol M., Bregant L., Boscarol A.

15h15

How to take into account the various modal behavior of a capstan to solve resonance problem.
Piot H., Vasselín J.

Wind Turbine Generator Bearing Fault Diagnosis using Amplitude and Phase Demodulation Techniques for Small Speed Variations.

Mollasalehi E., Wood D., Sun Q.

15h35

A probabilistic approach to the crack identification in a beam-like structure using monitored modes shape and their curvature data with uncertainty.
Shevtsov S.

15h55

Coffee Break

Signal processing for diagnostics

Session Chair: Cocconcelli M.

Signal modelling

Session Chair: Rubini R.

Multidimensional signal analysis for condition, operation and performance understanding of heavy duty mining machine.

Zimroz R., Stefaniak P., Sliwinski P., Andrzejewski M., Wylomanska A.

16h25

Modeling of rotating machine vibration signals operating under highly varying speed and load.
Urbanek J., Straczekiewicz M., Wiciak J., Jablonski A., Barszcz T., Harezlak J.

Empirical Mode Decomposition combined with Empirical Wavelets for extracting bearing frequencies in a noisy environment and early detection of defects.

Kedadouche M., Thomas M., Tahan Souheil A.

16h45

Electrical modelling for faults detection based on motor current signal analysis and angular approach.
Fourati A., Feki N., Bourdon A., Remond D., Chaari F., Haddar M.

Automatic and Full-band Demodulation for Fault Detection Validation on a Wind Turbine Test Rig.

Firla M., Li Z., Martin N., Barszcz T.

17h05

Robust information indices for diagnosing mechanical drives under non-stationary operating conditions.
Dolenc B., Boskoski P., Juricic D.

Diagnostics of a defective bearing within a planetary gearbox with vibration and acoustic emission.

Elasha F., Mba D., Greaves M.

17h25

Analysis and Signal Processing of a Gearbox Vibration Signal with a Defective Rolling Element Bearing.
Nader S., Ganeriwal S.

17h45

Presentation of the contest results

Room : Lima

Room : Mexico

Room : Toronto

Tuesday

9h00

Keynote Lecture - Session Chair: Gryllias K.

Luigi Garibaldi

Identification of Time Varying Systems

9h40

Coffee Break

Diagnostics under nonstationary conditions

Session Chair: Eltabach M.

Model identification & modal analysis

Session Chair: Rémond D.

Application of angular-temporal spectrum for detection of rolling-element bearing faults operating under varying speed regime.

Jablonski A., Urbanek J., Barszcz T.

10h20

Bicoherence and Support Vector Machines for bearing diagnosis.

Raad A., Kass A., Antoni J.

Application of modified adaptive minimum entropy deconvolution (MAMED) for local damage in planetary gearbox operating under nonstationary operations.

Obuchowski J., Wylomanska A., Zimroz R.

10h40

Diversity measures in classifier ensembles used for rotating machinery fault diagnosis.

Jamrozik W.

Gear diagnostics under widely varying speed conditions.

Randall R., Coats M., Smith W.

11h00

Vertical axis wind turbine states classification by a ART-2 neural network with a stereographic projection as a signal normalization.

Barszcz T., Bielecki A., Bielecka M., Wójcik M., Wluka M.

Bearing diagnostics under widely varying speed conditions.

Randall R., Smith W., Coats M.

11h20

Analysing State Dynamics Of Wind Turbines Through SCADA Data Mining.

Castellani F., Astolfi D., Terzi L.

Analysis of a planetary gearbox under non-stationary operating conditions: numerical and experimental results.

Molina Vicuna C., Chaaari F.

11h40

Development of expert system shell for coal mine industry.

Timofiejczuk A., Moczulski W., Kalisch M., Przystaka P., Sikora M.

12h00

Lunch & Posters session

16th december

13h30

Keynote Lecture - Session Chair: Dalpiaz G.

Jérôme Lacaille

Prognostic and Health Monitoring for Turbofans by Snecma, Engine Manufacturer

Signal Processing (nonstationary and IAS tracking)

Session Chair: Martin N.

Modelling

Session Chair: Raad A.

Blind separation of vibration components for rotor machinery operating under highly non-stationary regime.

Jablonski A., Urbanek J., Barszcz T.

14h15

Dynamic model of a spall defect on the outer ring of tapered roller bearing and estimation of radial and axial vibrations in stationary or non-stationary operating conditions.

Bourdon A., Rémond D., Rigal J.F.

Monitoring based on time-frequency tracking of estimated harmonic series and modulation sidebands.

Gerber T., Martin N., Mailhes C.

14h35

Modelling gear transmission vibrations in presence of pitch and run out errors.

Fernández Del Rincón A., Viadero Rueda F., Iglesias M., Diez Ibarbia A., De Juan A., García Fernández P.

Method of analysing non-stationary electrical signals.

Cablea G., Granjon P., Bérenguer C.

14h55

A Systematic Model Based Investigation of Shaft/Coupling Misalignment Signature using Vibration Analysis.

Ganeriwala S., Toth M.

Application of Non-Uniform Sampling concepts on vibration signals.

Hajar M., El Badaoui M., Raad A., Guillet F.

15h15

Condition monitoring of conveyor belts as a tool for proper selection of their replacement time, Operational Safety of Steel-Cord Conveyor Belts under Non-Stationary Loadings.

Ryszard Błażej, Leszek Jurdziak, Witold Kawalec

15h35

Coffee Break

Signal processing for diagnostics

Session Chair: Thomas M.

Vibration analysis

Session Chair: El Badaoui M.

Adaptive Vibration Diagnostic Technique for Bearings Condition Monitoring of Complicated Machines

Mironov A., Doronkin P., Priklonsky A.

16h05

Vibration Analysis of copper ore crushers used in Mineral Processing Plant - problem of bearings ...

Zimroz R., Stefaniak P., Obuchowski J., Wylomanska A., Krol R., Borkowski P., Hardygóra M.

Diagnostics of slow rotating bearings using a novel DAI based on acoustic emissions,

Aye S., Heyns S., Thiart C.

16h25

Study on Rotating Machine Vibration Behaviour Using Measured Vibro-acoustic Signals

Yunusa-Kaltungo A., Sinha J., Nembhard A.

Knife diagnostics with Empirical Mode Decomposition

Cotogno M., Cocconcelli M., Rubini R.

16h45

Condition monitoring of aircraft engine rotor system with stiffness anisotropy of rotor supports.

Comparative analysis of accelerometers mounting schemes Semenov S., Nikhamkin M., Sazhenkov N., Semenova I.

Methodology for the estimation of the fatigue life of rolling element bearings in non-stationary conditions Leturiondo U., Salgado O., Galar D., Mishra M.

17h05

An experimental technique to investigate gas-turbine blades dry-friction dampers efficiency Sazhenkov N., Nikhamkin M., Semenova I., Semenov S.

Dining

What better way to enjoy the night in Lyon...



Aboard the restaurant boat Hermès, explore an urban space founded two millennia ago and listed by UNESCO as World Heritage!. Dine while admiring the city lights and live a unique experience on the Rhône and the Saône Rivers.



During a 3 hour cruise, the Hermès navigates on the Rhône and the Saone, from the quays of the Rhône to the Ile Barbe,

Cruise

Departure and arrival at 16, Quay Claude Bernard - Lyon 7

Left bank of the Rhône River, close to the University Bridge

Bus line 35 : Stop "Rue de l'Université"

Tramway Line T1 : Stop "Quai Claude Bernard"



Meeting: 7h30 pm

Boarding time: from 8:00 pm

Departure : 8:30 pm

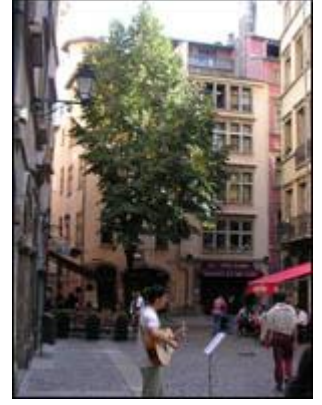
Return : around 11:15 pm



More Information <http://www.lyoncityboat.com/homepage>

Don't Miss

Vieux Lyon



Covering an area of 424 hectares at the foot of the Fourvière hill, it is one of Europe's most extensive Renaissance neighborhoods.

http://en.wikipedia.org/wiki/Vieux_Lyon

Tour of vieux-Lyon on smartphone : <http://www.vieux-lyon.org/webphone/menu-us.htm>

Fourvière Hill and its Basilique

<http://en.wikipedia.org/wiki/Fourvière>



Fourvière is a district of Lyon and also a hill immediately west of the old part of the town, rising abruptly from the river Saône and then gently sloping down to the north-west. It is the site of the original Roman settlement of Lugdunum (43 BC). Though it supports the world's two oldest and active funicular lines, it is primarily known for the Catholic Basilica of Fourvière.



in Lyon

The city is known for its historical and architectural landmarks and is a UNESCO World Heritage Site. Lyon was historically known as an important area for the production and weaving of silk and in modern times has developed a reputation as the capital of gastronomy in France.

It has a significant role in the history of cinema due to Auguste and Louis Lumière, who invented the cinematographe in Lyon. The city is also known for its famous light festival 'Fête des Lumières' which occurs every 8 December and lasts for four days, earning Lyon the title of Capital of Lights.

<http://fr.wikipedia.org/wiki/Lyon>



City Center



Parc de la tête d'Or



Located on the shores of Rhône river, in the heart of Lyon, its 289 acres make of the "Parc de la Tête d'Or", the greatest urban park of France. Totally destined for leisure, discovery and relaxation, its green spaces are the theater of many activities: zoo, merry-go-rounds, shops, shows, pony rides, botanicals garden... All is combined to make of your visit a magical while

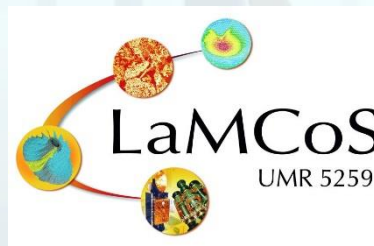
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