VIRM 11 - VIBRATIONS IN ROTATING MACHINERY

Institution of MECHANICAL ENGINEERS

13-15 September 2016
University of Manchester

Tribology Group and Mechatronics, Informatics & Control Group
Conference

Benefits of Attendance:

- Discover new computational techniques with significantly extended capabilities
- Learn experimental techniques in MIMO, modal analysis, mixed co-ordinates and finite volume methods
- Hear the latest thinking in rotordynamics of electrical machines
- Ensure your machines function correctly and reliably in any operating conditions
- Improve your material choices
- Find collaborators for future projects
- Network with an international group from industry and academia

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VIBRATIONS IN ROTATING MACHINERY – VIRM 11

13-15 September 2016, University of Manchester

WHY YOU SHOULD BE THERE

ATTEND THE MOST ESTABLISHED CONFERENCE IN THE FIELD OF ROTATING MACHINERY THAT FEATURES THE VERY LATEST RESEARCH AND DEVELOPMENT ACROSS ROTORDYNAMICS, BLADES, CONDITION MONITORING AND MORE.

Since Vibrations in Rotating Machinery (VIRM) was first held in 1976, it has defined and redefined the state-of-the-art in the many aspects of vibration encountered in all forms of moving machinery.

Join industrial and academic experts from a range of different countries and specialisms to discuss the challenges in rotordynamics, rub, whirl and instability along with condition monitoring in your profession.

Whether you are from industry or academia, involved in transport, power, process, medical engineering, manufacturing or construction, VIRM 11 will provide you with the latest R&D and guidance to make better material choices.

An Industry Leading Programme including Welcome Reception and Networking Dinner

Join speakers, delegates and exhibitors on the evening before the conference for a welcoming drinks reception, followed on 14 September with the official conference dinner, held at the DoubleTree by Hilton, Manchester Piccadilly.

Places are limited so booking is essential. Book your full delegate package pass today to guarantee your place.

Visit **www.imeche.org/VIRM** to find out more and reserve your place.

Key Conference Topics Include:

- Active magnetic bearings and control
- Balancing
- Bearings
- Blades
- Electrical machines
- Fault detection and condition monitoring
- Rotordynamics
- Rub, whirl and instability
- Torsional vibration

Organising Committee

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J. S Rao, Altair Engineering, India
Damian Vogt, KTH, Sweden

PROGRAMME

DAY ONE - 13 SEPTEMBER 2016

08:30 REGISTRATION AND REFRESHMENTS

09:10 KEYNOTE ADDRESS - PARAMETRIC EXCITATION IN ROTATING MACHINERY
Horst Ecker, Associate Professor, Vienna University of Technology

PLENARY SESSION - ROTORDYNAMICS 1

10:00 ROTOR MISALIGNMENT: SOME NOVEL PERSPECTIVES ON AN OLD PROBLEM
Arthur William Lees, Swansea University, United Kingdom

10:20 RESOLUTION OF UNWANTED SYNCHRONOUS VIBRATION
Prof Robley Gordon Kirk, Virginia Tech, United States of America

10:40 THE DYNAMICS OF LONG SHAFT VERTICAL PUMPS
Dr Doug C White, D C White Consulting Engineers, United Kingdom

11:00 Q&A SESSION

11:20 NETWORKING REFRESHMENT BREAK

	2A - GEARS	2B - ELECTRICAL
11:45	COMPLETE COMPUTATIONAL SCHEME TO PREDICT THE WHINING NOISE Dr Alexandre Carbonelli, VibraTec, France	STABILITY ANALYSIS OF INDUCTION ROTORS SUPPORTED IN SLEEVE BEARINGS, CONSIDERING ELECTROMAGNETIC FIELD DAMPING AND INTERNAL MATERIAL DAMPING OF THE ROTOR Prof Ulrich Werner, Georg Simon Ohm, University of Applied Sciences Nuremberg, Germany
12:05	EXPERIMENTAL MEASUREMENT OF GEAR MESH STIFFNESS BY PHOTO-ELASTICITY Naresh K Raghuwanshi, Indian Institute of Technology Indore, India	EXPERIMENTAL ANALYSIS OF THE DEAD BAND CLEARANCE IN A COMPLEX, VERTICAL ROTOR Prof Mihai Arghir, Institut PPrime, Universite de Poitiers, France
12:25	PORTABLE INDUCTION MOTOR MODEL FOR TORSIONAL VIBRATION ANALYSIS OF DRIVETRAIN SYSTEMS Dr Timo Halopainen, ABB Motors & Generators, Finland	METHOD TO DETECT THE CRITICAL BENDING SPEED OF AN INDUCTION MOTOR BY USING STATIC ROTOR ECCENTRICITY FOR DERIVING THE ROLLER BEARING STIFFNESS Christian Bauer, Siemens AG, Germany

12:45 Q&A SESSION

13:05 NETWORKING LUNCH

	3A - ACTIVE CONTROL	3B - BLADES
14:05	ACCELERATION BASED ON-LINE MONITORING AND CONTROL SYSTEM FOR SURFACE ROUGHNESS IN BORING PROCESS Prof Avinash Maruti Badadhe, JSPM's Rajarshi Shahu College of Engineering, India	VIBRATION ANALYSIS WITH REDUCED BLADE MODEL OBTAINED BY 3D-FEM Dr Osami Matsushita, National Defence Academy, Japan
14:25	PD CONTROL OF A SMART ELECTRO-MAGNETIC ACTUATOR JOURNAL INTEGRATED BEARING Prof Aly El-Shafei, Cairo University, Egypt	CALCULATION OF PITCH LINK LOADS AND ACTUATOR ROD LOADS BY USING BLADE POSITION AND BLADE LOADS Harun Tiras, TAI, Turkey
14:45	VIBRATION MINIMISATION ON A ROTOR SYSTEM WITH ADAPTIVE ALGORITHMS USING SELF-SENSING PIEZO-ELECTRIC ACTUATORS Ramakrishnan Ambur, Technische Universität Darmstadt, Germany	THE EFFECT OF SENSOR CHARACTERISTICS ON BLADE TIP TIMING MEASUREMENTS Nidhal Jamia, Swansea University, United Kingdom
15:05	ACTIVE CONTROL OF ROTORDYNAMICS USING ON-BOARD SENSING AND ACTUATION Samuel Jiminez, University of Bath, United Kingdom	MODEL ANALYSIS OF ROTATING STRUCTURES UNDER RANDOM MIMO EXCITATION Dr Christoph Schwingshackl, Imperial College London, United Kingdom

PROGRAMME

15:25	**Q&A SESSION**	
15:45	**NETWORKING REFRESHMENT BREAK**	
	4A - BEARINGS	**4B - MEASUREMENT**
16:10	**EFFECTS OF TEXTURED JOURNAL BEARINGS ON VIBRATIONS OF LIGHTWEIGHT ROTORS** Jocelyn Rebufa, CEA, France	**NON-LINEAR DYNAMIC MODELLING OF FUEL MANIFOLD SYSTEMS** Dr Christoph Schwingshackl, Imperial College London, United Kingdom
16:30	**INFLUENCE OF FLUID FILM CAVITATION EFFECTS ON THE STABILITY OF ROTORS IN JOURNAL BEARINGS** Gerrit Nowald, Technical University of Darmstadt, Germany	**THE METHODS FOR TESTING SHAFT VIBRATIONS AND FLOATING RINGS SPEED INSIDE A TURBOCHARGER BEARING HOUSING** Lubos Smolik, University of West Bohemia, Czech Republic
16:50	**MESH CONVERGENCE ANALYSIS IN THE TIME RESOLUTION OF NON-LINEAR HYDRODYNAMIC FORCES FOR JOURNAL BEARINGS** Prof Gregory Breignon Daniel, University of Campinas, Brazil	**A PRACTICAL GUIDE TO LASER DOPPLER VIBROMETRY MEASUREMENTS DIRECTLY FROM ROTATING SURFACES** Prof Steve Rothberg, Loughborough University, United Kingdom
17:10	**Q&A SESSION**	
17:30	**CHAIR'S CLOSING REMARKS**	
	END DAY ONE	

	DAY TWO - 14 SEPTEMBER 2016	
08:45	**REGISTRATION AND REFRESHMENTS**	
09:00	**CHAIR'S OPENING REMARKS**	
09:10	**KEYNOTE ADDRESS - COMPOSITE ROTORS AND SMART MATERIAL APPLICATIONS FOR VIBRATION CONTROL** **Dr K Gupta, Professor, Indian Institute of Technology (IIT) Delhi**	
	5A - ROTORDYNAMICS 2	**5B - CONDITION MONITORING 1**
10:00	**MULTI-FRAMES APPROACH IN ROTORDYNAMICS** Norbert C Kill, Samtech S.A, Belgium	**GENERIC VIBRATION-BASED FAULTS IDENTIFICATION APPROACH FOR IDENTICAL ROTATING MACHINES INSTALLED ON DIFFERENT FOUNDATIONS** Jyoti K Sinha, The University of Manchester, United Kingdom
10:20	**OBSERVATIONS ON A STEAM TURBO-GENERATOR SET VIBRATION BEHAVIOUR DURING SHUTDOWN PERIOD** Dr Jyoti Sinha, The University of Manchester, United Kingdom	**FAULT DIAGNOSIS OF CENTRIFUGAL PUMPS BASED ON SUPPORT VECTOR MACHINE ALGORITHMS** Prof Rajiv Tiwari, IIT Guwahati, India
10:40	**MULTI-ROTORDYNAMICS WITH ALL STEADY STATE ROTATION EFFECTS ELIMINATING TIME DEPENDENCY IN DYNAMIC MATRICES** Angel Martinez, ITP, Spain	**ELECTROMAGNETIC INTERFERENCE IN VIBRATION SIGNALS AND ITS EFFECT ON BEARING DIAGNOSTICS** Dr Wade Smith, University of New South Wales, Australia
11:00	**REDUCED ORDER MODELS FOR NON-LINEAR ROTATING MACHINES** Prof John Edward Penny, Aston University, Birmingham, United Kingdom	**DIAGNOSTIC EXPERIMENTS FOR STABILITY OF ROTOR-OIL FILM BEARING SYSTEMS USING RADIAL MAGNETIC BEARING EXCITATION** Wataru Tsunoda, Tokyo Institute of Technology, Japan
11:20	**Q&A SESSION**	

PROGRAMME

11:40	**NETWORKING REFRESHMENT BREAK**	
	6A - WHIRL	**6B - AMB**
12:05	**VIBRATION CHARACTERISTICS AND STABILITY OF GROUPED STEAM TURBINE VANE** Prof Yasutomo Kaneko, Ryukoku University, Japan	**ON THE DROP OF A ROTOR-AMB SYSTEM ONTO TOUCH-DOWN BEARING** Clement Jarroux, GE Oil & Gas, France
12:25	**THE TRANSIENT VIBRATIONS ATTENUATION OF ROTORS DAMPED BY MAGNETORHEOLOGICAL DAMPERS UTILISING BI-LINEAR MATERIAL AND THE DELAYED YIELDING PHENOMENON TO MODEL THE LUBRICATING OIL** Prof Jaroslav Zapomel, Institute of Thermomechanics, Czech Republic	**ELECTROMECHANICAL APPROACHES FOR SEMI-ACTIVE AND ACTIVE VIBRATION CONTROL IN ROTATING MACHINERY – A SURVEY OF RECENT ACTIVITIES AT FRAUNHOFER LBF** Rainer Nordmann, Fraunhofer LBF, Germany
12:45	**EXPERIMENTAL STUDY ON STATIC AND DYNAMIC CHARACTERISTICS OF HELICALLY GROOVED SEALS** Keisuke Nagai, Graduate School of Nagaoka University of Technology, Japan	**DESIGN AND CONSTRUCTION OF AN ACTIVE MAGNETIC BEARING SUPPORTED DYNAMIC TEST RIG FOR FLUID FILM JOURNAL BEARINGS AND SQUEEZE FILM DAMPERS** Richard Jayawant, Waukesha Magnetic Bearings, United Kingdom
13:05	**Q&A SESSION**	
13:25	**NETWORKING LUNCH**	
	7A - BEARINGS	**7B - BALANCING**
14:25	**AN APPROACH FOR THE EQUIVALENT STIFFNESS OF ELASTOHYDRODYNAMIC LINE CONTACT** Natalia Akemi, Hoshikawa Tsuha, University of Campinas, Brazil	**SENSITIVITY ANALYSIS OF AN IN-SITU ROTOR BALANCING** Sami Meshal, F Ibn Shamsah, University of Manchester, United Kingdom
14:45	**INVESTIGATION ON THE CONVERGENCE OF EHD LUBRICATION IN ANGULAR CONTACT BALL BEARING** Leticia Bizarre, University of Campinas, Brazil	**AN AUTO-BALANCER DEVICE TO CONTROL A VARIABLE IMBALANCE (APPLICATION IN EU LOWASH PROJECT)** Christian Clerc, VibraTec, France
15:05	**PROGNOSIS OF ROLLING ELEMENT BEARINGS BASED ON NON-LINEAR AUTO-REGRESSIVE NEURAL NETWORK WITH EXOGENOUS INPUTS** Dr Sanjay H Upadhyay, Indian Institute of Technology Roorkee, India	**A METHOD FOR BALANCING HIGH SPEED ROTORS FROM LOW ROTATION SPEED DATA USING PARAMETRIC EXCITATION** Shachar Tresser, Technion, Israel Institute of Technology, Israel
15:25	**EXPERIMENTAL INVESTIGATION ON DYNAMIC CHARACTERISTICS OF TEXTURED JOURNAL BEARING WITH SQUARE-DIMPLES** Hiroyuki Yamada, Graduate School of Nagaoka University of Technology, Japan	**AN EVALUATION OF COMPUTATIONAL METHODS TO SPECIFY THE EFFECTS OF LIQUID BALANCERS** Lars Spannan, Otto-von-Guericke University Magdeburg, Germany
15:45	**Q&A SESSION**	
16:05	**NETWORKING REFRESHMENT BREAK**	
	8A - CONDITION MONITORING 2	**8B - ELECTRICAL**
16:30	**INDUCTION MOTOR FAULT IDENTIFICATION BASED ON VIBRATION MONITORING WITH ONE VERSUS ONE MULTICLASS SUPPORT VECTOR MACHINE ALGORITHMS** Prof Rajiv Tiwari, IIT Guwahati, India	**ROTOR VIBRATIONS IN ELECTRICAL MACHINES WITH STRUCTURAL NON-LINEARITIES OF THE LAMINATED CORE STACK** Michael Kerschbaumer, Graz University of Technology, Austria

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16:50	**FINITE ELEMENT MODEL BASED CRACK FORCE IDENTIFICATION IN A ROTOR SYSTEM INTEGRATED WITH ACTIVE MAGNETIC BEARINGS** Prof Rajiv Tiwari, IIT Guwahati, India	**MODAL TESTING OF A PRE-STRESSED LAMINATION STACK** Stefan Haas, Graz University of Technology, Austria
17:10	**VIBRATION TROUBLESHOOTING CASE STUDIES ON ROTATING MACHINERY FROM V_BASE WITH PRACTICAL LESSONS DERIVED** Prof Masato Tanaka, University of Tokyo, Japan	**NOISE RADIATED BY ELECTRICAL MACHINES: SIMULATION AND OPTIMISATION CASES** Jean-Baptise Dupont, VibraTec, France
17:30	**Q&A SESSION**	
17:50	**CHAIR'S CLOSING REMARKS**	
19.00	**CONFERENCE DINNER** **VENUE: DOUBLETREE HILTON HOTEL MANCHESTER PICCADILLY** **LIMITED SPACES AVAILABLE. ADDITIONAL CHARGE APPLIES.** **VISIT WWW.IMECHE.ORG/VIRM TO BOOK YOUR PLACE**	

	DAY THREE - 15 SEPTEMBER 2016	
08:45	**REGISTRATION AND REFRESHMENTS**	
09:00	**CHAIR'S OPENING REMARKS**	
09:10	**KEYNOTE ADDRESS - SCIENTIFIC METHODS AND TOOLS IN ROTORDYNAMICS FOR THE DESIGN PROCESS OF LARGE HIGH PERFORMANCE TURBOMACHINERY** **E Knopf, Head of Rotordynamics, GE Power**	
	9A - RUB-INSTABILITY	**9B - BEARINGS**
10:00	**MODELLING OF THE ROTOR SYSTEM CONTACTING WITH THE ROTABLE BACKUP BEARING** Prof Tsyoshi Inoue, Nagoya University, Japan	**UNCERTAINTY QUANTIFICATION OF A NON-LINEAR ROTOR BEARING MODEL WITH STOCHASTIC COLLOCATION** Prof Helio Fiori De Castro, University of Campinas, Brazil
10:20	**A COMPARATIVE STUDY OF VARIOUS CONSTRAINT ENFORCEMENT TECHNIQUES FOR ROTOR STATOR RUB** Prof Kshitij Gupta, Department of Mechanical Engineering, Indian Institute of Technology Delhi, India	**A NEW APPROACH FOR MODELLING THE FOIL STRUCTURE IN THE SIMULTANEOUS SOLUTION OF FOIL-AIR BEARING ROTORDYNAMIC PROBLEMS** Dr Philip Bonello, University of Manchester, United Kingdom
10:40	**SYNCHRONOUS WHIRL INSTABILITY IN A HIGH SPEED OVERHUNG ROTOR** Danilo Matos, Howden Group Technology, United Kingdom	**SIMULATIONS OF THE NON-LINEAR DYNAMIC RESPONSE OF A TURBOCHARGER ON FOIL-AIR BEARINGS WITH FOCUS ON UNBALANCE EXCITATION** Dr Philip Bonello, University of Manchester, United Kingdom
11:00	**ROTOR-STATOR CONTACT IN MULTIPLE DEGREE OF FREEDOM SYSTEMS** Dr Alexander Shaw, Swansea University, United Kingdom	
11:20	**Q&A SESSION**	
11:40	**NETWORKING REFRESHMENT BREAK**	
	10A - AMB	**10B - CONDITION MONITORING 3**
12:05	**CONTROL OF ROTORS SUSPENDED ON LOW-COST AMB'S** Prof Seamus Garvey, University of Nottingham, United Kingdom	**A NEW INTERPRETATION OF THE TEAFER KAISER ENERGY OPERATOR** Prof Robert Randall, University of New South Wales, Australia

PROGRAMME

12:25	**THE PASSIVE AND ACTIVE STABILISATION OF THE ELECTRO-DYNAMIC MAGNETIC BEARINGS SUPPORTING HIGH-SPEED ROTORS** Prof Tomasz Szolc, Polish Academy of Sciences, Poland	**WEAK SIGNATURE EXTRACTION OF BEARING FAULT USING HILBERT ENVELOP** Dr Sachin Kumar Singh, Indian School of Mines, Dhanbad, India
12:45	**ACTIVE VIBRATION CONTROL OF ROTOR MOUNTED ON MOVING BASE USING ELECTROMAGNETIC ACTUATOR WITH 'VISOELASTIC SEMI SOLID-LIKE' CONTROLLER CHARACTERISTICS** Tukesh Soni, University Institute of Engineering & Technology, Panjab University, Chandigarh, India	**EVALUATION OF A MODEL-BASED IDENTIFICATION METHOD FOR HYDRODYNAMIC BEARING** Ricardo Mendes, University of Campinas (UNICAMP), Brazil
13:05	**Q&A SESSION**	
13:25	**NETWORKING LUNCH**	
	11A - BEARINGS	**11B - CONDITION MONITORING 4**
14:25	**SIMULATIVE ANALYSIS OF TURBINE TRAINS UNDER BLADE FRACTURE CONDITIONS WITH REGARD TO THE IMPLEMENTATION METHODS OF JOURNAL BEARINGS** Prof Elmar Woschke, Otto-von-Guericke, University Magdeburg, Germany	**FREQUENCY DOMAIN AVERAGING BASED EXPERIMENTAL EVALUATION OF GEAR FAULT WITHOUT TACHOMETER FOR FLUCTUATING SPEEDS** Vikas Sharma, Indian Institute of Technology Indore, India
14:45	**MODEL-BASED SIMULATION OF AN OIL-WHIP PHENOMENON OCCURRED IN A JOURNAL BEARING OF A POWER UNIT** Prof Andrea Vania, Politecnico di Milano, Italy	**GEAR FAULT DIAGNOSIS USING PROBABILITY DENSITY FUNCTION AND ENTROPY MEASURES FOR GEAR ACOUSTIC EMISSION SIGNAL** Ram Sharma, Indian Institute of Technology, Indore, India
15:05	**EXPERIMENTAL EVIDENCES OF A CYLINDRICAL JOURNAL BEARING OPERATING AT VERY LOW SOMMERFELD NUMBERS** Prof Paolo Pennacchi, Politecnico di Milano, Italy	**HYBRID INTELLIGENT MODEL WITH ENTROPIC FEATURES FOR CLASSIFICATION OF BALL BEARING FAULTS** Prof Asoke Nandi, Brunel University London, United Kingdom
15:25	**Q&A SESSION**	
	SESSION 12 - PLENARY SESSION	**CLOSING SESSION AND AWARDS**

Find out more about our speakers, please visit www.imeche.org/VIRM

- This programme is subject to change.
- The Institution is not responsible for the views or opinions expressed by individual speakers.

WHO SHOULD ATTEND:

VIRM 11 will bring together industry and academia involved in transport, power, process, medical engineering, manufacturing or construction. The following audience profiles will find VIRM 11 of particular relevance.

- Vibration Analysts
- Condition Monitoring Engineers
- Vibration Engineers
- Chief Engineers
- Design Engineers
- Rotordynamics Engineers
- Mechanical Design Engineers
- Business Development Managers
- Professors
- PhD Students

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FEES AND CHARGES

Registration fees include entry to the sessions, refreshments, and a copy of selected presentations. Full delegate package includes access to networking reception and conference dinner.

Delegate Type	Early Bird Rate Available until 22 July	Standard Rate
Member, IMechE/Supporting Organisation Full Delegate Package	£560.00 + VAT	£655.00 + VAT
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THREE WAYS TO BOOK

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Please inform us of any special requirements, ie dietary or access, on the relevant section of this form.

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The organisers do not accept liability for any injuries or losses of any nature incurred by delegates and/or accompanying persons, nor for loss or damage to their luggage and/or personal belongings.

CONFERENCE VENUE
University of Manchester, Oxford Rd, Manchester M13 9PL

ACCOMMODATION
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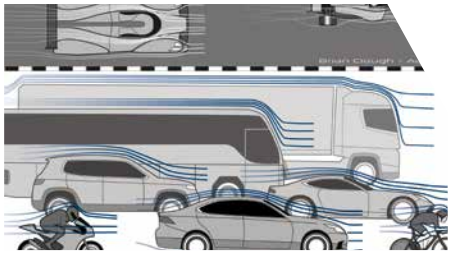

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