11TH INTERNATIONAL CONFERENCE

HIGH SPEED MACHINING

ADVANCES IN MANUFACTURING TECHNOLOGY

11—12/9 2014

PRAGUE | CZECH REPUBLIC

PROGRAMME

Contents

Welcome

Welcome to the 11th International Conference on High Speed Machining HSM 2014 in Prague! The HSM conference runs every year in various countries of the world. The conference is organized by a consortium of partners involving PTW Darmstadt (Germany), IK4 Tekniker (Spain), Ensam Paritech (France), RCMT – Research Center of Manufacturing Technology (Czech Republic) and NUAA – Nanjing University of Aeronautics and Astronautics (China). This year, the conference is proudly organized in the Czech Republic by RCMT with the sponsorship of the International Academy for Production Engineering CIRP.

The advantages of high speed machining technology were discovered by Prof. Solomon at the beginning of 1930s. Significant advances in cutting tool materials and tool coatings accelerated the great progress in high speed machining technology in 1990s. High speed machining technology brought a new paradigm both to machining strategies and design of machine tools and their components. Still, there are some challenges in the continuous development of high speed machining technology. The HSM 2014 Conference pays attention to all of them:

Mathematical modelling of machining operations | Mathematical modelling of the cutting process facilitates our understanding of process details in the cutting edge and workpiece contact region.

Cutting tool design | Design of cutting tools is a complex task involving aspects of macrogeometry (cutting tool angle), microgeometry (cutting edge geometry and its preparation) and coatings. Cutting tool design strongly influences cutting force magnitude, tool wear resistance and general application possibilities.

Cutting fluids | This wide and important topic involves a wide spectrum of solutions today. Starting with dry and semidry cutting, continuing with MQL and high-pressure cooling up to cryogenic cooling, there are many useful combinations for each specific machining operation and workpiece material.

Mathematical modelling of machines | The virtual machining concept enables us to do accurate simulations of machine tool properties and resultant workpiece quality at the design stage, without the need for expensive and time demanding experimental testing.

Chatter modelling and suppression | Chatter is a special phenomenon connecting properties of the machine tool, the workpiece and the cutting technology.

Tool path planning | A well prepared NC code is one of the cornerstones of effective machining. It is a complex task involving geometrical information on the workpiece, control system interpolator properties, dynamic limits of the machine tool, its feed drives and collision avoidance issues.

Micromachining | The production of parts with specific micro features is essential for current electronic and optical industry. General machining demands remain, but the required tiny dimensions bring new challenges.

We believe that the presented papers will serve as a valuable source of information and also boost research networking in the future. We would like to thank all the authors for their contributions to the conference programme and proceedings. We would also like to express our gratitude to the members of the international scientific committee for their time, effort and constructive feedback, which have helped a great deal in preparing the HSM 2014 Conference.

Thank you again for your support and I wish you a fruitful and pleasant conference!

Dr. Petr Kolář
Chairman of the 11th International Conference on High Speed Machining HSM 2014

Acknowledgements

The Czech Technical University in Prague

The Czech Technical University in Prague
Faculty of Mechanical Engineering
Research Center of Manufacturing Technology

Czech Machine Tool Society

IK4 Tekniker

Technische Universität Darmstadt
The Institute of Production Management
Technology and Machine Tools

Ecole Nationale Supérieure d´Arts et Métiers

Nanjing University of Aeronautics and Astronautics

Sponsored by the International Academy for Production Engineering CIRP

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Faculty of Mechanical Engineering
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Faculty of Mechanical Engineering
Czech Technical University in Prague

Dr. Matěj Sulitka | Research Center of Manufacturing Technology
Faculty of Mechanical Engineering
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Prof. Scott Smith, USA
Prof. Gábór Stépán, Hungary
Dr. Luis Uriarte, Spain
Prof. Michael Zäh, Germany
Dr. Mikel Zatarain, Spain
Dr. Pavel Zeman, Czech Republic

Keynote Speakers

Prof. Friedrich Bleicher, Austria
Dr. Oliver Gossel, Germany
Prof. Ning He, China
Prof. Michael Zäh, Germany

Session Chairmen

Prof. Eberhard Abele
Prof. Friedrich Bleicher
Prof. Alain D´Acunto
Prof. Ning He
Prof. Jerzy Jedrzejewski
Prof. Chengyu Jiang
Dr. Petr Kolář
Dr. Jokin Muñoa
Prof. Piotr Niesłony
Prof. Tuğrul Özel
Dr. Matěj Sulitka
Prof. Michael Zäh
Dr. Pavel Zeman

Conference Office

Zuzana Čejková

Local Organizing Team

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Jan Vláčil
Tomáš Zavázal

Keynote Speakers

Prof. Friedrich Bleicher | Germany

is Head of the Institute of Production Engineering and Laser Technology at the Vienna University of Technology. After finishing his master's degree in Mechanical Engineering, he worked as a research assistant at the Institute of Production Engineering and Laser Technology. In 1996 he obtained his doctorate in Mechanical Engineering and in 2001 he became an associate professor at the Institute for Production Engineering and Laser Technology.

In 2009 he received a professorship in Production Engineering and Chipping Technology at the Vienna University of Technology. His main topics of research cover machining processes with geometrically defined and undefined cutting edges, process automation, development and optimization of machine tools, parallel kinematics, EDM technologies, and rapid manufacturing.

Dr.-Ing. Oliver Gossel | Germany

is head of the Röders sales department and with this also responsible for Röders' technical center. After earning the Dipl-Ing. degree for mechanical engineering he worked for four years at the Technical University Hamburg as a research assistant. In 1996 he obtained his doctorate for research on robot accuracy. In 1996 he started working as a development engineer at Röders GmbH in Soltau, Germany. One year later he was promoted to project manager at development and sales. In 2005 he became head of the development department at Röders and since 2007 he has been in his current position.

Prof. Ning He | China

is a professor at The College of Mechanical and Electrical Engineering and the dean of International Education at Nanjing University of Aeronautics and Astronautics (NUAA), China. He obtained his BSc., MSc. and Ph.D. degrees in mechanical manufacturing from NUAA in 1982, 1987 and 1997 respectively. Prof. Ning He started his research in the area of metal cutting in 1982. In 1993 he became an associate professor at the Department of Manufacturing and Automation of NUAA. In 1999 he became a professor at the College of Mechanical and Electrical Engineering of NUAA. Currently, his research interests mainly include high performance cutting, micro cutting, analysis and control of machining deflection of monolithic components and sustainable machining. As project leader, Prof. Ning He won 2 items of second prizes and 3 items of third prizes of Minister Level Science and technology Progress Award in China. He is a Standing Committee Member of the China Metal Cutting Tool Engineering Association and Vice Director of the Chinese Society of Advanced Machining (CMCTEA).

Prof. Michael Friedrich Zäh | Germany

born 1963 in Coburg, Bavaria, Germany, studied Mechanical Engineering at the Technische Universität München and obtained his degree in 1989. His diploma thesis on the stability analysis of machine tools was awarded the Student Prize of the VDW (German Machine Tool Builders' Association) 1989. He then studied for his doctor's degree under Prof. Dr.-Ing. Joachim Milberg at Technische Universität München from 1990 to 1993 (Dr.-Ing. in 1993) and was department leader under Prof. Dr.-Ing. Gunther Reinhart. He looks back at an industrial career in the machine tool industry from 1996 to 2002 (Gleason-Pfauter GmbH in Ludwigsburg). Since 2002 Michael F. Zäh has been full Professor for machine tools and manufacturing technology at Technische Universität München. He maintains several memberships in scientific institutions, such as The International Academy for Production Engineering (CIRP – associated member).

Conference Venue

The conference is held in the Hotel Grand Majestic Plaza Prague (Truhlarska 16, Prague 1). The hotel is situated in the center of the city and provides full-service and comfortable accommodation.

Conference Office

The HSM conference office can be found on the 1st floor (Conference Level) of the Hotel Grand Majestic Plaza Prague.

Phone: +420 605 205 912

Registration Desk

The registration desk is located on the Conference Level of the Hotel Grand Majestic Plaza Prague.

Opening time

Thursday, 11th September 08:00 – 18:00

Friday, 12th September 08:30 – 16:00

Phone: +420 605 205 912

On-site payments can be settled in cash € only. ATM for Czech crowns (Kč) is a 5-minute walk from the conference venue in the PALLADIUM shopping center.

Internet Access / Computer Room

Free wireless Internet access is available on the Conference Level and in hotel rooms. Password is not necessary, please, choose the GM1 internet interface. Computers with printing facilities in a separate computer room are available to all participants.

Prague

Prague is the capital city of the Czech Republic, home to a number of famous cultural monuments. The structure of the old part of the city has remained almost intact in its historical appearance, which makes the atmosphere of the city unique.

The main attractions include: the Prague Castle, Charles Bridge, Old Town Square, Jewish Quarter, Lennon Wall, and Petřín Hill. Since 1992, the historic centre of Prague has been inscribed on the UNESCO list of World Heritage Sites. In 2011, Prague was the sixth most visited city in Europe.

General Information

Instructions for Speakers

Each meeting room is equipped with a projector and a laptop. Speakers are requested to upload their presentations to the laptop in the room in due time before the start of their session. Own laptop may also be used. Laptops are equipped with Microsoft Windows 7, Office 2010 (Powerpoint, Word, Excel), Adobe Acrobat Reader, Windows Media Player and VLC Video Player. Technical support is provided in the meeting rooms. The length of the presentation is limited to 20 minutes. We expect 15 minutes for the presentation itself and 5 minutes for a discussion.

Poster Session

The poster must be put up during the registration period (September 11th between 8:00 until 9:00). All tools necessary for fastening the poster to the presentation frame will be prepared at the registration desk. The official presentation of the posters is on September 11th between 12:50 and 13:30. We would like to ask poster presenters to be present near their poster in order to answer the conference participants' questions.

Badges and Tickets

The colors of name badges indicate the program options chosen.

Participants – **Blue**

Visitors – **Green**

Organizers – **Red**

Only persons wearing the **"HSM 2014 Blue"** badges are entitled to attend the meetings, lunches and social event.

Persons wearing the **"HSM 2014 Green"** can only attend meetings.

Insurance

The Organizers of the HSM 2014 do not provide insurance and do not take responsibility for any loss, accident or illness that might occur during the Conference or in the course of travel to and/or from the meeting site. It is, therefore, the responsibility of the participants to check their coverage with their insurance provider.

Useful phone numbers

Emergency numbers can be dialed without a coin or a card:

Ambulance: 155

Police: 158

Municipal Police: 156

Fire Brigade: 150

Overall Emergency: 112

Tourinform Hotline: +420 221 714 444 (9:00–12:00, 13:00–16:00)

Lunches

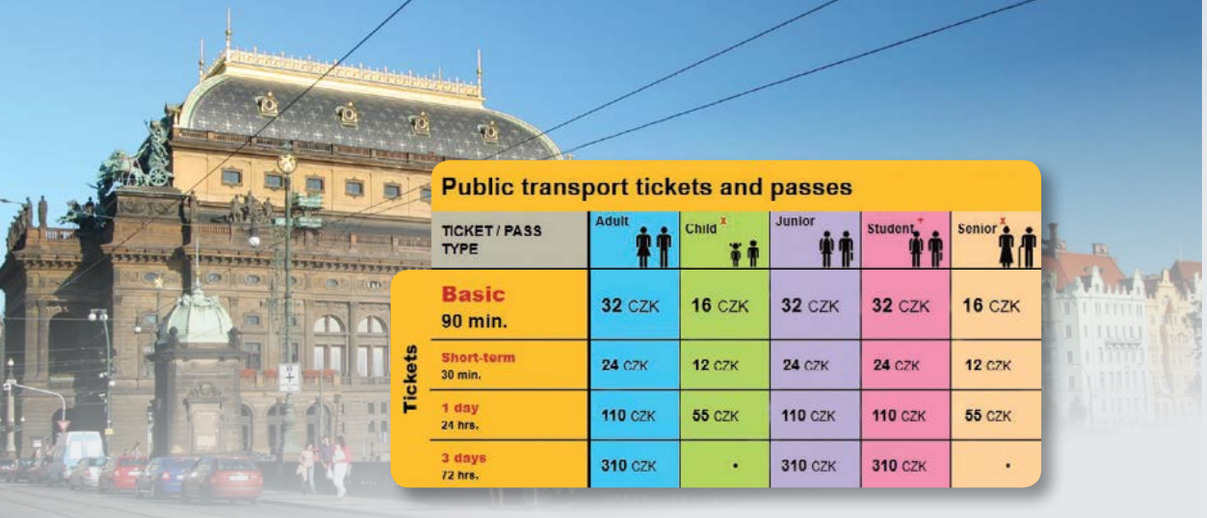
Lunch for the conference delegates is served in the ATRIUM restaurant on the Conference Level, the Hotel Grand Majestic Plaza Prague.

Coffee breaks

Coffee and refreshments are served in the Foyer on the Conference Level, the Hotel Grand Majestic Plaza Prague.

Currency, credit cards

The currency unit is the Czech crown (CZK), denoted as "Kč" by Czechs.
International credit cards (EC/MC, Visa/ Visa Electron) are accepted at most hotels, restaurants and shops. ATMs are available at the airport and all over the city.



Public transport tickets and passes

TICKET / PASS TYPE	Adult	Child x	Junior	Student +	Senior x
Tickets — **Basic** 90 min.	32 CZK	16 CZK	32 CZK	32 CZK	16 CZK
Short-term 30 min.	24 CZK	12 CZK	24 CZK	24 CZK	12 CZK
1 day 24 hrs.	110 CZK	55 CZK	110 CZK	110 CZK	55 CZK
3 days 72 hrs.	310 CZK	•	310 CZK	310 CZK	•

TRAVEL INFO

Arrival by car

The Grand Majestic Plaza Prague Hotel is located in the very center of Prague (Truhlářská 16, Praha 1). The hotel offers onsite car parking (€ 25 per day).

Arrival by plane

By public transport

Take bus No. 100 from the Prague Airport to the terminal metro stop Zličín on line B (Yellow), where you change to metro. Go from Zličín to Náměstí Republiky (12 stops).

Taxi

We would like to offer you a taxi from the airport for a fixed price of **€ 18**.

If you are interested in using this service, please send us your time arrival and flight number to **conference@hsm2014.cz.**

You can also take an AAA Taxi. One-way trip to the city center is about € 26.

Arrival by train

From Hlavní Nádraží train station or Nádraží Holešovice train station take the metro line C (Red) to Florenc station, where you change the line from C (Red) to B (Yellow), then travel to Náměstí Republiky (1 stop).

Public transportation

Tickets should be purchased in advance (e.g. at metro stations, hotels, newsstands, tobacco shops). The tickets should be validated (on board or at the entrance gates), and kept, since one must provide them if requested by inspectors on board or at the exit gates.

The metro station "Náměstí Republiky" on line B (Yellow) is a 5-minute walk from the conference venue.

You can find public city transport routes, ticket prices and timetables on **www.dpp.cz/en/**.

Conference program

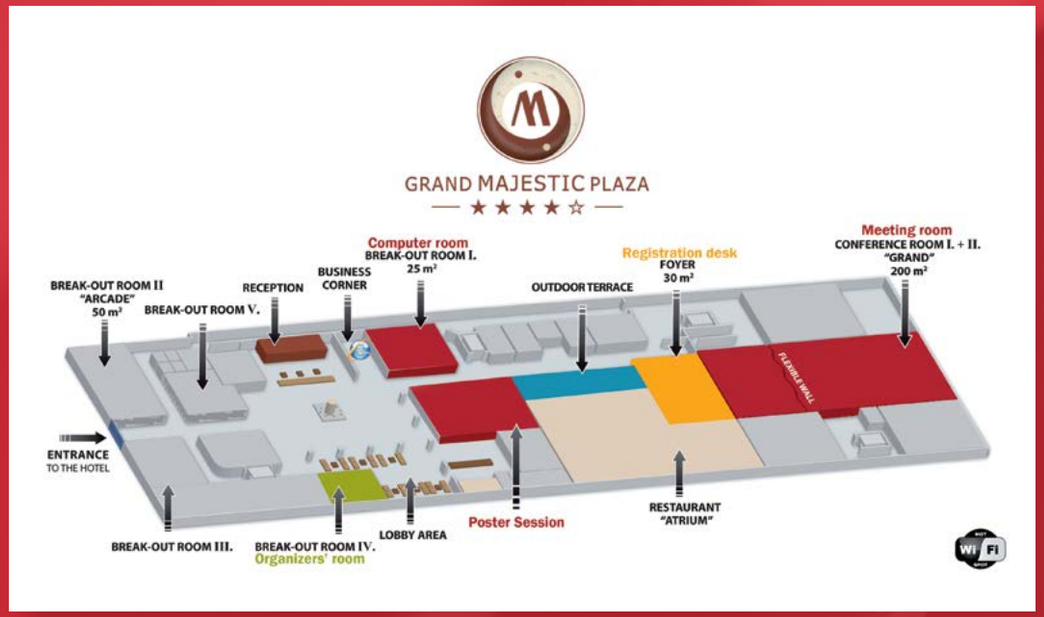
Thursday, 11th September 2014

Invitation, Keynotes, Presentations in Sessions – Meeting Room, Poster Session

Social Event – Strahov Monastic Brewery

Friday, 12th September 2014

Presentations in Sessions – Meeting Room



Programme of 11th International Conference HIGH SPEED MACHINING
11 – 12 September 2014, Prague, Czech Republic

Day 1 (Thursday, September 11th)

9:00 – 9:10	Welcome	Conference opening by Dr. Petr Kolář, Research Center of Manufacturing Technology		
9:10 – 9:30	Machine tool research in the Czech Republic	Speech by Dr. Jan Smolík, Research Center of Manufacturing Technology		
9:30 – 10:00	Trends in machine tool design and use	Keynote speech by Prof. Michael Zäh, Institute for Machine Tools and Industrial Management, TU Munich		
10:00 – 10:30	Latest developments on high speed cutting machines: improvements of accuracy, speed and enlargement of area of application	Keynote speech by Dr. Oliver Gossel, RÖDERS GmbH		
10:30 – 10:50	Coffee Break			
10:50 – 11:20	High Performance Machining of Aerospace Parts	Keynote speech by Prof. Ning He, Nanjing University of Aeronautics and Astronautics		
11:20 – 11:50	Improvement of die casting life time by machine hammer peening	Keynote speech by Prof. Friedrich Bleicher, Institut für Fertigungstechnik und Hochleistungslasertechnik, TU Vienna		
11:50 – 12:50	Lunch			
12:50 – 13:30	**Poster session*** (See below for a list of poster presentations)			
	Paper Nr.	**Session 1:** Machine tool and workpiece modelling **Session chairman:** Prof. Michael Zäh	Paper Nr.	**Session 2:** Machining modelling **Session chairman:** Prof. Tuğrul Özel
13:30 – 13:50	14061	Stiffness improvements in complex portable machine structures by means of topology optimization	14019	Coupled eulerian-lagrangian modelling of high speed metal cutting processes
13:50 – 14:10	14089	The modelling of liquid cooling for the efficient reduction of thermal errors in heavy duty machine tools	14020	Finite element modeling of the orthogonal machining of particle reinforced aluminum based metal matrix composites
14:10 – 14:30	14092	Simulation model for quick predictions of workpiece dynamic response in machining	14079	Workpiece temperature model-ling in CGI drilling process in dry condition
14:30 – 14:50	14052	Prediction of the spindle and tool receptance: Industrial application in reaming process	14081	Machining modeling, using SPH methodology

14:50 – 15:10	Coffee Break			
	Paper Nr.	**Session 3:** Chatter modeling and suppresion **Session chairman:** Prof. Friedrich Bleicher	Paper Nr.	**Session 4:** High speed machining **Session chairman:** Prof. Eberhard Abele
15:10 – 15:30	14078	Investigation of hexapod robot dynamics and its effects in milling	14029	High speed machining of profiled grooves in nickel-based alloys
15:30 – 15:50	14044	Chatter suppression in a high speed magnetic spindle by adding damping	14076	Analysis and measurement of cutting temperature in high speed machining of aluminum alloy
15:50 – 16:10	14050	A method of identification of complex cutting forces acting in unstable cutting process	14071	High speed gear hobbing with cemented carbide hobs
16:10 – 16:30	Coffee Break			
	Paper Nr.	**Session 5:** Chatter modeling and suppresion **Session chairman:** Dr. Jokin Muñoa	Paper Nr.	**Session 6:** Cutting tool design **Session chairman:** Prof. Alain D´Acunto
16:30 – 16:50	14012	Analytical time-domain model for tool point dynamics in turning	14053	Derivation of recommendations for the manufacturing of high-speed reaming tools
16:50 – 17:10	14034	Optimal control laws for chatter suppression using inertial actuator in milling processes	14084	Cutting tool development for effective milling of Ti6Al4V
17:10 – 17:30	14013	Integration of machining mechanistic models into CAM software	14090	Material specific cutting edge geometries for machining processes
from 18:00	Social Event			
*Poster session	Paper Nr.		Paper Nr.	
	14015	Heat flux modeling during the machining operations of an explosive material – application to drilling	14054	BN-based cutting tools for high-speed cutting of hardened steel and cast iron grades
	14025	Trajectories in laser machining ceramics: Thermal model to control material removal rate	14055	Optimization of design, processing, and cutting performance diagnostics of the cutting inserts based on ceramic composite materials
	14027	Monitoring of cutting process in end milling of hard and brittle materials	14060	HiPIMS coated carbides with high adhesive strength for hard machining
	14030	Investigation on minimization of chatter vibration in thin-wall machining of Al7075-T651	14064	Real time chatter vibration control system in high speed milling
	14037	Time domain criteria for controller parameterization by simulation based optimization	14068	Experimental study in plunge milling of damage-tolerant titanium alloy TC21
	14043	Analysis of machining configurations with ball-end mills in order to finish parts made by EBM and comparison with numerical model	14088	Both-side drive of a ball screw feed axis – verification of the theoretical assumptions

Day 2 (Friday, September 12th)

	Paper Nr.	**Session 7:** Cutting fluids **Session chairman:** Dr. Pavel Zeman	Paper Nr.	**Session 8:** Machining analysis & optimization **Session chairman:** Prof. Chengyu Jiang
9:00 – 9:20	14011	Turbine blade machining by use of carbon dioxide as cryogenics	14018	Velocity measurement of chips at the gun drilling process with an optical measurement systém
9:20 – 9:40	14035	The influence of high-pressure lubricoolant supply variant on cutting performance in turning of 42CrMo4+QT	14022	Phenomenological investigations of heat sources and boundary conditions for metal cutting processes
9:40 – 10:00	14065	An experimental investigation of friction and cutting mechanics under the MQL and MQL+CO2 conditions	14046	Prediction and compensation of process induced shape deviations in multi-axis high-speed hard finish milling
10:00 – 10:20	14080	Evaluation of carbide tool performanced under conventional coolant and alternative minimal quantity lubrication in high speed turning Ti-6Al-4V ELI	14096	Slot machining of Ti6Al4V with trochoidal milling technique
10:20 – 10:40	Coffee Break			
	Paper Nr.	**Session 9:** Tool path planning **Session chairman:** Dr. Matěj Sulitka	Paper Nr.	**Session 10:** Machining analysis & optimization **Session chairman:** Prof. Pioter Niesłony
10:40 – 11:00	14039	2D tool-path generation method for multi-axis milling machine using TOF camera	14016	Wear study and performance evaluation in the machining of MMC with PCD and PCDN tools

11:00 – 11:20	14041	Parameters set-up for collision avoidance and smooth motion in 5-axis end milling based on a potential field approach	14017	Comparison of machining inconel 718 with conventional and sustainable coolant
11:20 – 11:40	14042	Feedrate optimization in 5-axis machining based on direct trajectory interpolation on the surface using an open CNC	14073	Characterization of the cutting phenomenon in orbital drilling of titanium alloys (TiAl6V4)
11:40 – 12:00	14085	A new algorithm for smooth and efficient morphing-based planar tool path generation	14074	Study of tangential force exerted on rake face during high-speed end milling of Inconel 718
12:00 – 13:00	Lunch			
	Paper Nr.	**Session 11:** Machine tool components **Session chairman:** Prof. Jerzy Jedrzejewski	Paper Nr.	**Session 12:** Micromachinig **Session chairman:** Prof. Ning He
13:00 – 13:20	14038	Dynamic modelling of an electro–hydraulic actuator to isolate machine tools from ground vibrations	14031	Experimental investigation in micro-ball-end milling of hardened steel
13:20 – 13:40	14040	Damping in linear guides considering operational factors	14033	Investigation on micromilling of EBM Ti6Al4V titanium alloy
13:40 – 14:00	14082	Study on vibration response of high-speed spindle with bearing defects	14045	Study of elementary micro-cutting in hardened tool steel
14:00 – 14:20	14036	A new device for spindle accuracy inspection	14051	Study of burr formation and phase transformation during micro-milling of NiTi alloys
14:20 – 14:40	Coffee Break			
	Paper Nr.	**Session 13:** Machine tool design **Session chairman:** Dr. Petr Kolář		
14:40 – 15:00	14014	CNC data acquisition: system development and validation		
15:00 – 15:20	14024	Integration of discontinuous milling operations into the flow production of sheet metal profiles		
15:20 – 15:40	14070	Development of forced cooling using mist of strong alkaline water for restraining thermal deformation on a machine tool		
15:40 – 15:50	Closing the conference			

Social Program

Social Event

Thursday, 11th September

Attire: Business

18:00 — All participants will assemble in the lobby of the Hotel Grand Majestic Plaza Prague and conference organizers will show them to a bus that will take them to the social event. Please be punctual.

19:00 Social event in the Strahov Monastic Brewery, Strahovské nádvoří 301, Prague 1

21:00 Jazz concert of Noční optika.

23:00 Departure to the hotel

Strahov Monastic Brewery

The Strahov Monastic Brewery is located close to the Prague Castle in the building of the Strahov Monastery, founded in the 12th century. The monastery commands a magnificient view of Prague. The brewery was first documented at the turn of the 13th and 14th centuries. The decision to build a new and fully functional brewery, where the restaurant is placed today, was made by Abbot Kaspar Questenberg in 1628.

The jazz band Noční optika is an instrumental quintet composed of musicians whose starting point is partially modern jazz, partially classical music. The young interprets play their own music composed by the band's founder Jakub Dvořáček and the guitarist of the band Miroslav Nosek.

Accommodation

We recommend accomodation in hotels located close to the conference venue:

Hotel Grand Majestic Plaza Prague

The new design hotel Grand Majestic Plaza, a member of Worldhotels chain is located in one of the most desirable locations, in the heart of historical and business centre of Prague. The hotel is within walking distance from all major tourist attractions, just a few steps from the famous Municipal House, Gothic Powder Gate, Republic Square and most attractive PALLADIUM shopping centre. The conference is held in this hotel.

1 Art Deco Imperial Hotel Prague

A gem of genuine Art Deco architecture, Prague Art Deco Imperial Hotel provides five-star accommodation and superior services to business and leisure travellers who prefer intimacy and individual approach of a boutique hotel to busy big brand places.

The hotel is located within a 5-minute walk from the conference place at the Hotel Grand Majestic Plaza Prague.

2 Hotel Salvator

The Salvator hotel is listed historical building. Czech architects have preserved the characteristics of Old Town buildings.

The hotel is located within a 3-minute walk from the conference place at Hotel Grand Majestic Plaza Prague.

3 Hotel Atlantic Prague

Hotel Atlantic is situated directly in the heart of Prague; the Municipal House and the main Prague shopping boulevard are just around the corner. You can reach the Old Town, the Charles Bridge and other places of interest by foot within several minutes. There is also a subway stop „Namesti Republiky" line "B" just 100 meters from the hotel door. You can also reach the hotel by your own car. You have the possibility of parking in the hotel car park.

Hotel Map

- Hotel Grand Majestic Plaza Prague
- 1 Art Deco Imperial Hotel
- 2 Hotel Salvator
- 3 Hotel Atlantic Prague

Contact

Chairman

Dr. Petr Kolář

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Organizers and Partners

The HSM conference is organized with the support of these partners and institutions:

The Czech Technical University in Prague

The Czech Technical University in Prague
Faculty of Mechanical Engineering
Research Center of Manufacturing Technology

Czech Machine Tool Society

IK4 Tekniker

Ecole Nationale Supérieure
d´Arts et Métiers

Technische Universität Darmstadt
The Institute of Production Management,
Technology and Machine Tools

Nanjing University
of Aeronautics and Astronautics

Sponsored by the International Academy
for Production Engineering CIRP

List of participants

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Ahmad Rafiq	University of Luxembourg	Luxembourg
Andreas Elenz	Walter AG	Germany
Bach Pavel	Czech Technical University in Prague, Faculty of Mechanical Engineering, Research Center of Manufacturing Technology	Czech Republic
Berenger Escolle	FEMTO-ST Institute	France
Berglind Luke	The University of North Carolina at Charlotte	The United States of America
Beutner Martin	Otto-von-Guericke-Universität Magdeburg, Institut für Fertigungstechnik und Qualitätssicherung	Germany
Blecha Petr	Brno University of Technology, FME, Institute of Production Machines, Systems and Robotics	Czech Republic
Bleicher Fritz	Vienna University of Technologic, Institute of Production Engineering and Laser Technology	Austria
Bourderioux Julien	Le Commissariat à l´énergie atomique et aux énergies alternatives	France
Brockmann Matthias	RWTH Aachen, WZL – Laboratory for Machine Tools and Production Engineering	Germany
Cayli Tolga	RWTH Aachen, WZL – Laboratory for Machine Tools and Production Engineering	Germany
D´Acunto Alain	Ecole Nationale Supérieure d´Arts et Métiers	France
Del Conte Erik Gustavo	Federal University of ABC, The Engineering, Modeling and Applied Social Sciences Center	Brazil
Demarbaix Anthonin	University of Mons	Belgium
Dieter Lung	RWTH Aachen, WZL – Laboratory for Machine Tools and Production Engineering	Germany
Dolimont Adrien	University of Mons	Belgium
Fernández David	IK4-Tekniker	Spain
Florussen Guido	IBS Precision Engineering	The Netherlands
Frekers Yona	RWT Aaachen, WSA – Institute of Heat and Mass Transfer	Germany
Gierlings Sascha	RWTH Aachen, WZL – Laboratory for Machine Tools and Production Engineering	Germany
Gilbin Alexandre	École Nationale Supérieure de Mécanique et des Microtechniques	France
Gossel Oliver	Röders GmbH	Germany
Gyliene Virginija	Kaunas University of Technology	Lithuania
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Heep Thomas	Technische Universität Darmstadt	Germany
Hellmich Arvid	Technische Universität Chemnitz	Germany
Hendrik Puls	RWTH Aachen, WZL – Laboratory for Machine Tools and Production Engineering	Germany
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