TECHNICAL UNIVERSITY
OF CLUJ-NAPOCA
FACULTY OF MACHINE BUILDING
DEPARTMENT OF MANUFACTURING ENGINEERING

MTeM 2011

10th INTERNATIONAL CONFERENCE

MODERN TECHNOLOGIES IN MANUFACTURING

FINAL PROGRAM

Cluj-Napoca
ROMANIA
6th - 8th October 2011

WELCOME MESSAGE

Cluj is a well-known cultural and scientific European centre. By its technical achievements, this city has gained more and more importance for science and culture, spiritual freedom and initiative spirit and the great decisions kept in the memory of generations tell us that the contemporary scenery is the creation of the technical genius, perfected by taste, pertaining to nature, just like the spirit of things in the human spirit.

That is to see, feel, think, innovate and build for a better world. The technical education in Cluj was launched with this idea in 1777, simultaneously with the "Ratio Education's" imperial regulations, which introduced the study of architecture, hydrotechnics and geodesy alongside with the study of mechanics to the school of Cluj. This is how it happens that the history of the technical education and instruction of Cluj is both a mixture of signs and a mirror in which everyone looks at his own reflection, to know himself better.

At present, the responsibility of the Technical University of Cluj-Napoca has got another dimension related to evaluation, skills and performance, quality and visibility. Now we are an EU member state and we have to be prepared to face the rapid changes of society.

The strategic philosophy of the Technical University of Cluj-Napoca postulates that the science of the beginning of this new millennium shall focus both on interdisciplinarity and on the personalized evolution of innovative sciences. They will progress extremely rapidly because they have the courage to admit their own errors, manifesting a moderate admiration towards success and admit the things they owe to the past. If we think this way, we need an anticipative strategy, since science is the enterprise of the spirit, which casts light on the blurry icon of the world by a great collective adaptation effort.

That is why the history of the technical education in Cluj is a mixture of signs and also a mirror reflecting everyone's face for a better self-knowledge.

By steady looking to the world, one may understand better than ever that we are living in a world of change wherein the spiritual independence and coping with "new paradigms" increasingly become the site innovation. The "new" is born out of "tradition", but in a world of change innovative tradition as source of innovation expands the "value of tradition". The promotion of the innovative thinking is the main objective of the 10th International Conference "Modern Technologies in Manufacturing".

Therefore, the Technical University of Cluj-Napoca provides cognitive services in the European education, within a trans-national process.

We are concerned with the internationalization of education, with the need to increase the flexibility of the academic careers through the correlation of the educational system with other social systems, but we also know that the future must be planned according to the resources and cooperation developed at an international level.

At present, we participate in hundreds of cooperation projects established with universities from Europe or other continents. These projects are community or bilateral programmes, but also scientific partnerships with well-known companies from all over the world.

It is not by accident that this conference brings together participants from Bulgaria, Czech Republic , Ukraine, Hungary, Kosovo, Poland, Slovak Republic, Serbia, Slovenia, and, of course, Romania.

The topics of the conference are interesting and cover various domains, from Manufacturing Engineering to Quality Assurance, from CIM and Process Control to Concurrent Engineering, Rapid Prototyping, Expert Systems and Non- conventional Technologies. By their originality and the scientific content, the papers belonging to all of these fields reflect the state-of-the-art in the areas mentioned above.

We are interested in internationalizing education, making the academic career more flexible by articulating the education system with the other systems, but future has to be designed with the assistance of resources. Immediate future shall lead us from initial training to permanent continuous learning and our university trains students to LEARN more than just TEACHES. That is to say, it teaches you to learn. Nowadays, the issue becomes more complex because school has to react to the challenges imposed on it by globalization, because the future graduates shall be facing its effects.

In this context, the Technical University of Cluj-Napoca acts as an institution opened to the world trends. There are study programmes in English, German and French in the Technical University of Cluj-Napoca. We could also mention several other aspects, facts or mere intentions or dreams of our own.

In the Technical University of Cluj-Napoca, we can have a scientific dialogue by learning the languages of other people, and by striving to change our mentality in order to become better Europeans. In the context of globalization, a good European is a person understanding the global mission of this continent that gave humanity more value than any other part of the world. A good European will carry in his mind these values, even if diffuse, as he is able to find the bridge connecting him with other people's values. A good European is a tolerant person understanding the community spirit. A European scientific researcher gives a good appreciation to such a conference, because its message is addressed to the whole world!

In the context of promoting globalization seen as a harmonized reunion of local diversities, education is considered both factor and effect at the same time. As foreseen, education and even more so instruction are called to react to the globalization, and to play a decisive part in the development of future societies.

In our university the key word most certainly is the word "perspective", which automatically invokes the future. But if we understand the need of

reality, we can think about what Paul Valery said: "The trouble with our times is that the future is not what it used to be." We don't need to conduct any philosophical discourses on this matter, but we need to understand that future must be prepared differently every year.

University has a privileged relationship with truth, goodwill, knowledge and, on a practical level, with the intellectual and moral progress of society. New knowledge is produced in universities and scientific theories are assessed and changed by analytical criticism, in the same place. The ethic of society is in continuous change and under the influence of the ideas stated in lecture halls, the laws become less repressive, more incentive and formative. On this dimension, the central values of the university are freedom, right, dignity but also professionalism, renewal, creativity and reinterpretation.

The strategy of the university is based on the concept of change with the support of sustainable development, centred on intellectual creativity, a feature, which plays an essential part in the transition towards a new social model. Engineers are aware that future products shall imply intellectual analysis and a creative component, which shall observe the requirements of an intensely cultural, information-based society. The strategy of creating and improving human resources are the mark of modernity, having as a goal education in itself and the involvement of all essential factors in the educational process.

The Technical University of Cluj-Napoca evolves as a knowledge processor focused on engineering sciences, which becomes the engine of regional development, by its attractive characteristics for great investments.

Looking assiduously towards Europe, we understand, more than ever, that we live in a world of continuous change, in which the independence of the spirit and the surmounting of paradigms lead to innovation and innovation is more important than the value of tradition.

By the philosophy of its strategy, the Technical University of Cluj-Napoca considers education as a transnational process, which contributes to the international dimension within the European educational context and also sees reform as a means of making the academic career more flexible and turning instruction in an extra-mural activity. We are open to the world and we have the calling of cooperation!

This conference is an opportunity to look to the world with admiration and respect, and looking to it we look at ourselves with the hope to become what we would like to!

Last but not least, I wish this conference to be successful ensuring the participants of my distinguished consideration.

Welcome!

Prof. Dr. Eng. Radu MUNTEANU
Rector of the Technical University of Cluj-Napoca

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SECTIONS AND VENUE OF THE CONFERENCE

SIGN	NAME	VENUE
Plenary	Plenary Session	Room Rubin
S1	Manufacturing engineering technologies and non-conventional technologies	Room Rubin
S2	Cold metal forming and composite materials	Room Chesterfield
S3	Automation of manufacturing systems assembly and CAD	Room Chesterfield
S4	Quality assurance and CIM	Room Chesterfield
S5	Gear transmission	Room Rubin
S6	Rapid prototyping and non-conventional technologies 1	Room Rubin
S7	Rapid prototyping and non-conventional technologies 2	Room Rubin

Note: All actions will be held at Hotel Topaz

THE 10th INTERNATIONAL CONFERENCE
MODERN TECHNOLOGIES IN MANUFACTURING
MToM 2011

SCHEDULE OF EVENTS

WEDNESDAY October 5th

16.00 - 20.00	Registration (Room Winsdor)
19.00 - 21.00	Welcome drink (Restaurant Hotel Topaz)

THURSDAY October 6th

8.00 - 9.30	Registration (Room Winsdor)
9.30 - 10.15	Opening Ceremony
10.15 -10.45	Coffee break
10.45-12.45	**Plenary Session**
13.00-14.30	Lunch break (Restaurant Hotel Topaz)
14.30-16.00	**Sessions S1 and S2**
16.00-16.30	Coffee break
16.30-18.00	**Sessions S3 and S5**
19.30	Welcome Party

FRIDAY October 7th

9.00-10.30	**Sessions S4 and S6**
10.30-11.00	Coffee break
11.00-12.30	**Session S7**
12.30-13.30	Lunch break (Restaurant Hotel Topaz)
14.00-17.00	Trip to Turda Salt Mine
18.00	Visit of the Aiud castle and wine testing in Aiud wine Cellar

SATURDAY October 8th

Cultural Program

Thursday, October 6th, 2011

08^{00} **Registration** (Room Winsdor)

09^{30} – 10^{15} **Opening Ceremony**

10^{15}- 10^{45} **Coffee Break**

10^{45} – 12^{45} **Plenary Session** (Room Rubin)

1. **Manufacture of Gear with Tooth Modifications**
   V. Simon

2. **New Developments in Additive Manufacturing and Innovative Manufacturing**
   N. Bâlc, P. Berce

3. **Ion D. Lăzărescu, Engineer, Professor, Innovator and Visionary**
   H. Giurgiuman

13^{00}-14^{30} **Lunch break (Restaurant Hotel Topaz)**

Thursday, October 6th, 2011 14^{30} - 16^{00}

Session S1 **Room Rubin**

Manufacturing Engineering Technologies and Non-conventional Technologies

Chairmen: János KODÁCSY, Dănuţ JULEAN

1. Research of the State of Surface Layer after Centerless Grinding
Legutko, S.; Wieczorowski, K.; Kluk, P.

2. Magnetic Finishing of Metal Parts Based on Plastic Deformation and Abrasion
Kodácsy, J.; Líska, J.; Danyi, J.

3. Stochastic Model of Manufacturing Equipment's Maintenance Processes
Pokorádi, L.

4. Study on the Process of Environmentally Conscious Drilling
Dezső, G.; Szigeti, F.; Varga, Gy.

5. Device for Grinding of Recees Helicoidal Surfaces at the Cutting Tools Adaptable on the Plane Grinding Machines
Micaciu A.; Vuşcan I.

6. Establishing the Formula for Adjusting a Device for Checking the Pitch of the Exterior Cylindrical Helical Surfaces
Micaciu A.; Vuşcan I.

7. Selection Criteria for Cutting Plates at High Speed Machining
Băilă, D.

8. Method of Defining the Tool's Effective Rake Angle in Case of Small Thickness of the Cutting Layer
Velchev, S.; Kolev, I.; Sovilj, B.; Ivanov, K.; Sovilj-Nikić, I.

9. Instrumental Providing of Ultraprecision Mashining of Polymers for Bioengineering Destination
Lavrynenko, S. N.; Mamalis, A.G.; Rucki, M.

10. Speed Evaluation and Comparisson of Additive Manufacturing Systems
Drstvenšek, I.; Valentan, B.; Balič, J.; Brajlih, T.

11. Research on the Predictive Maintenance Procedure for Paper Industry
Costea, A.; Gyenge, Cs.

12. Assesment of Factors Influencing Surface Roughness on Turning Of Aa6060-T6
Julean, D.; Nedezki, C.

13. Generating of Technological Parameters for the Design and Optimization Blanking Tools
Krrabaj, S.; Bytyci, B.; Osmani, H.;

Session S2 **Room Chesterfield**

Cold Metal Forming and Composite Materials

Chairmen: Dorel BANABIC, Horaţiu IANCĂU

1. Technological Aspects Regarding the Bending of Large Diameter Tubes
Mureşan, C.; Achimaş, Gh.; Popa, A.; Budai, A.F.

2. Lubrication of Injection Molds Used for the Pressurized Aluminum Casting
Kiksi, V.; Achimaş, G.; Haragâş, S.; Budai, A.F.

3. The Quality of Small Diameter Tubular Parts Obtained by Cold Extrusion
Stoica, L.; Achimaş, Gh.; Popa, A.; Budai, A.F.

4. Possibilities of Increasing the Quality of Sheet Metal Parts Using the Fine Blanking
Mihăilescu, N.; Achimaş, Gh.; Popa, A.; Sudrijan, M.; Budai, A.F.

5. Considerations Regarding the Influence of Manufacturing Processes of the Composite Structures on their Mechanical Behaviour
Florea, C.; Iancău, H.

6. CAM System for Design and Simulation Process of Extrusion for Small Pieces Used in Mining Industry
Grozav, S.; Oprea, O.V.; Gligor Gh.

7. Research on The Shock Heat Treatment Method Used for Modifying the Formability of Aluminium Alloys
Bichiş, I.; Banabic, D.; Comşa, D.S.

8. Research Regarding the Delamination of Carbon/Epoxi Composites Plates
Bere, P.; Berce, P.; Iancau, H.; Sabau, E.

9. Research on Extrusion Optimization for Reinforced Polyamide
Popescu A.; Iancău H.; Hancu L.; Prună R.

10. Mechanical Behavior of Plain Woven Carbon Fabric Reinforced Shape Memory Polymer Composites
Bocşan, I.; Hancu, L.; Borzan, M.; Fabre, M.; Ivens, I.

11. Runner System of Plastic Injection Mould
Paclt, R.

12. The Batching Injection of CO_2 in Blow Molding Process
Brdlík, P.

Session S 3 **Room Chesterfield**

Automation of Manufacturing Systems Assembly and CAD

Chairmen: Ivan KURIC, Peter KOŠTÁL

1. Distinction of the Individual Components Before Assembly in The Workspace of Intelligent Assembly Cell
Šebeňová, S.; Danišová, N.; Velíšek, K.

2. Laboratory of Flexible Manufacturing
Kostal, P.; Mudrikova, A.

3. Selective and Dynamic Classification
Kuric, I.

4. Inside Air Temperature and Modeling of Closed Space by Non-Stationary Heat Transfer Conditions
Selimaj, R.; Osmanaj, S.

5. Introducing Improved Space Analysis Capabilities of Surface Constructor
Dudás, L.

6. Augmented Reality Applied in Assembly Design S2
Bondrea, I.; Petruse, R.

7. Construction of the Mold for Observation the Filling Stage of Pim Technology in Automatic Cycle
Petera, P.

8. Design of Material Flow, Machine and Devices Layout and Their Application on the Model Example
Krajčová, K.; Pecháček, F.

9. Optimization of the Hoisting System of Vehicle
Hamidi, B.

10. The Research of Wireless Industrial Communication Systems for Mechatronic and Logistics Systems
Trohák, A.; Kolozsi-Tóth, M.

10. Numerical Simulation Analysis and Form Optimization of Autonomous Underwater Vehicle
Farkas, F. A.; Bodea, F.; Vuşcan, I.

11. Contribution for Control of Autonomous Underwater Vehicle (AUV)
Farkas, F.A.; Bodea, F.; Vuşcan, I.

Thursday, October 6th, 2011 16^{30} - 18^{00}

Session S 5 **Room Rubin**

Gear Transmission

Chairmen: Vasile BOLOŞ, Illés DUDÁS

1. A New Method of Manufacturing the Worm Gear with Concave Profile
Nieszporek, T.; Boca, V.

2. Manufacture of Face-Hobed Spiral Bevel Gears on CNC Hypoid Generator
Simon, V.

3. **Modeling and Mathematical Analysis of Conical Helical Surface**
Bodzás, S.; Illés D.

4. **General Mathematical Model for Investigation of Cylindrical and Conical Worms and Hobs**
Illés, D.

5. The Contact Between a Face Milling Cutter and a Helical Surfaces
Albu, S.; Pozdîrca, Al.

6. Computer Aided Simulation of Coal Extraction Process with Complex Technological Systems
Andras, I.; Kovacs, I.; Andras, A.; Tomuş, B.

7. The Influence of the Tool Path Regarding the Roughness Resulted from the Milling Process of the Complex Surfaces
Cheţan, P.; Boloş, V.

8. **Experimental Study of the Thermal Limit for the Gearbox Worm Face-Gear with Reverse Tapered Pinion**
Bucur, B.; Boloş, V.

9. Numerical Modeling Research on the Double Front Worm Wheel
Ciotea, M.; Boloş, V.

10. Aspects Regarding Profile Modification of Spur Gears
Bob, M.; Bob, D.

11. New Technological Solution for Gear Transmission Manufacturing
Oláh, L.M.; Gyenge, Cs.; Bogár I.

12. Improvements to the Sonic Drilling Head
Gyenge, Cs.; Murariu, V.

Friday, October 7th, 2011 — 9[00] – 10[30]

Session S 4 — **Room Chesterfiled**

Quality Assurance and CIM

Chairmen: Nadezna ČUBONOVÁ, László DUDÁS

1. Mathematical Model for Optimization of the Cutting Conditions by Drilling
Kolev, I.; Sovilj, B.; Sovilj-Nikić, I.

2. The Machine Part Control by Using On-Machine Measurement Systems
Omámik, M.; Baránek, I.

3. Software Program for Training of Control System Sinumerik 840D
Čuboňová,N.; Kuric,I.

4. Development of Supplier-Rating Based on Fuzzy Set Theory
Portik, T.; Varga, T.; Pokorádi, L.

5. Risk Assessment Method Regarding to Environmental Impact and Safety and Health of Workers in Pulp and Paper Industry
Fulop, D.; Gyenge,Cs.; Fulop, I.

6. Parametrization of Curves Obtained from Clouds of Points Using CATIA Environment
Pescaru, R.; Oancea, Gh.

7. Advanced Non-Real-Time Monitoring Systems: Two Case Studies
Biró, V; Banabic, D.

8. Intelligent Systems for Machining Processes Monitoring
Patalita, C.P.; Vuşcan, I.

9. Early Detection of Machine Faults Based on Vibrations Monitoring and Analysis
Vuşcan, I.; Patalita, C.P.

10. Contributions about the Optimization of the Guillotine Knives Geometry Used in the Company "S.C. Novis House Publishing and Printing S.R.L." Cluj-Napoca
Trif, A.; Borzan, M.; Barboni, E.

11. Studies About Screw Tap Execution Technology and Screw Tap Control
Borzan, M.; Trif, A.; Bereschi, A.

12. Methods of Implementing Continuous Flow
Filip, F.C.

13. Analysis of Voltage Source Inverter Through D, Q Model
Osmanaj, S.; Selimaj, R.

Session S 6 **Room Rubin**

Rapid Prototyping and Non-conventional Technologies 1

Chairmen: Ioan VUŞCAN, Marcel POPA

1. Materials Development and Electrical Discharge Machining of High Performance Ceramics
Landfried, R.; Kern, F.; Gadow, R.

2. Aspects of Public Service Management
Cioban, D.; Achimaş, Gh.; Popa, A.; Budai, A.F.

3. An Application of Virtual Reality in the Automotive Industry
Capustiac, A.; Banabic, D.

4. Researches regarding manufacturing of porous metal structures for medi-cal application produced by selective laser melting (SLM)
Leordean, D.; Marcu, T.; Prem, F.; Radu, S.A.; Berce, P.

5. Researches Regarding the Behavior of a Al_2O_3 Particle in a Plasma Jet Considering the Injection Angle and the Diameter of the Particle
Cigan V.; Vuşcan I.

6. Mathematical Modeling and Analysis of Process Temperatures in Drilling Reinforced Composites Using Response Surface Methodology
Pop, G.M.; Popa, M.S.; Pfeifroth, T.; Koukach, D.

7. Process Temperature Determination in Drilling Reinforced Plastics Composites Using IR Thermography
Pop, G.M.; Popa, M.S.; Contiu, G.; Koukach, D.

8. Mathematical Modelling of the EDM Process using the Cu-St Pair of Materials
Tirla, A.; Popa, M.S.; Koukash, D.; Preja, D.; Badiu, I.

9. Considerations about the Kinematics Motions of the Machining Centers Using Specific Devices
Mircea, A.; Vuşcan I.

Friday, October 7th, 2011 11^{00} – 12^{30}

Session 7 **Room Rubin**

Rapid Prototyping and Non-conventional Technologies 2

Chairmen: Nicolae BÂLC, Igor DRSTVENŠEK

1. The Manufacturing of Silicone Rubber Molds for the Food Industry
Păcurar, R. A.; Berce, P.; Müller, P; Balaş, M.

2. Mathematical Modelling of the EDM Process using the Graphite-Steel Pair of Materials
Tirla, A.; Popa, M. S.; Preja, D.; Koukash, D.; Simon, V.

3. Injection Moulding using Metal Spraying Technology
Fodorean, I.; Berce, P.; Muresan S.; Pop, D.

4. Experimental Research in the Field of SLM, for the Production of Biocompatible Components
Pop, D.; Berce, P.; Filip, A.; Muresan, S.; Fodorean, I.

5. Influence of Process Parameters to Manufacture Titanium Parts by SLM
Mureşan, S.; Bâlc, N.; Pop , D.; Fodorean, I.

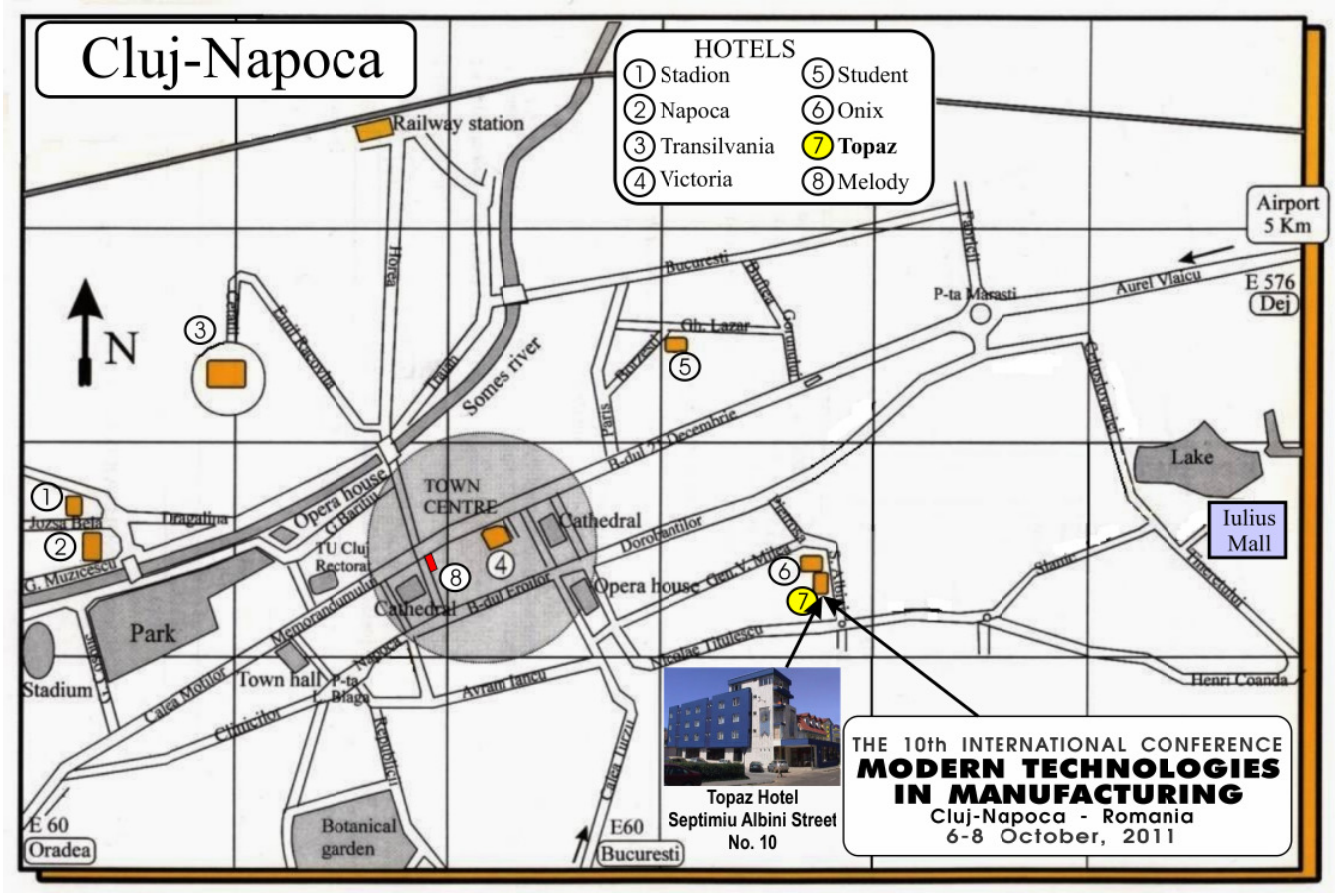
6. The Influence of Working Parameters of SLM Technology on Surface Quality and Precision of Stainless Steel Parts
Prem, F.; Leordean, D.; Bâlc, N,; Păcurar, R.

7. Mathematical Modeling of Aluminum Vacuum Casting Process
Luca, A.; Bâlc, N.; Drstvensek I.; Popan A.

8. A New Software Solution for Abrasive Water Jet Cutting
Popan A.; Bâlc N.; Luca A.; Curta R.

9. Research Regarding Heat Affected Zone after EDM-WC Process
Balaş, M.; Bâlc, N.; Păcurar, Ramona

10. New Software to Generate the CNC Code for Turning Operations
Curta, R.T.; Bâlc, N.; Cărean A.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Cluj-Napoca - Romania
6-8 October, 2011