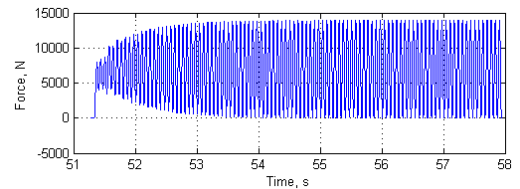
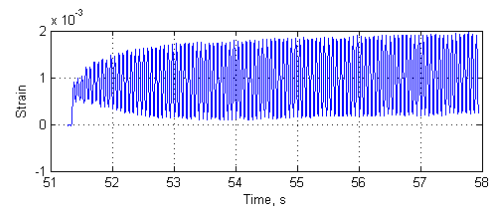
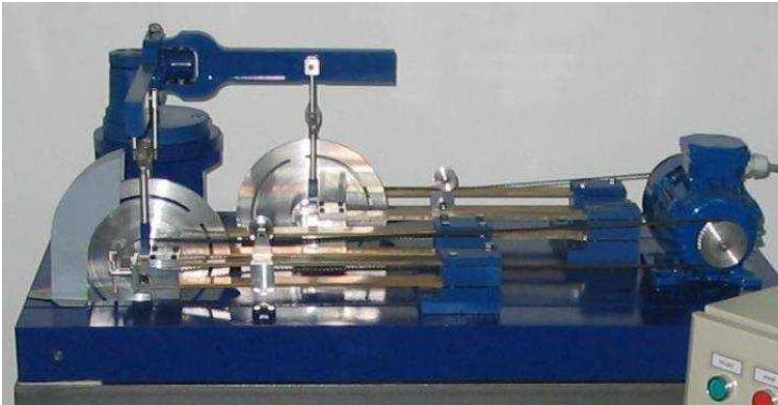


XV International Colloquium MECHANICAL FATIGUE OF METALS

13 – 15 September 2010, Opole, POLAND



XV-ICMFM PROGRAMME

OPOLE UNIVERSITY OF TECHNOLOGY
Faculty of Mechanical Engineering
Department of Mechanics and Machine Design
and Polish Society of Theoretical and Applied Mechanics, Opole Branch

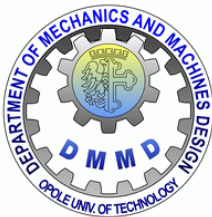


XV INTERNATIONAL COLLOQUIUM MECHANICAL FATIGUE OF METALS 13 – 15 SEPTEMBER 2010, OPOLE, POLAND

The International Colloquium Mechanical Fatigue of Metals (ICMFM) belongs to successful meetings with long tradition. The first Colloquium was held in 1972 (Brno, CZ), then in 1973 (Dresden, DE), 1975 (Jabłonna, PL), 1977 (Brno, CZ), 1979 (Dresden, DE), 1981 (Kyiv, UA), 1983 (Miskolc, HU), 1985 (Gdańsk, PL), 1987 (Bratislava, SV), 1989 (Dresden, DE), 1991 (Kyiv, UA), 1994 (Miskolc, HU), 2006 (Ternopil, UA) and 2008 (Varna, BG).

ORGANIZERS

Department of Mechanics and Machine Design
Opole University of Technology
and Polish Society of Theoretical and Applied Mechanics, Opole Branch



The XV International Colloquium Mechanical Fatigue of Metals (XV-ICMFM) is being organized by Department of Mechanics and Machine Design from Centre of Structural Integrity (CESTI), Opole University of Technology.

The Colloquium is supported by European Structural Integrity Society (ESIS) and Polish Ministry of Science and Higher Education.



COMMITTEES

International Scientific Committee

Chairman: Ewald MACHA (Poland)	
Alexander BALITSKII (Ukraine)	Jerzy OKRAJNI (Poland)
Jozef CACKO (Slovak Republic)	Thierry PALIN-LUC (France)
Andrea CARPINTERI (Italy)	Volodymyr PANASYUK (Ukraine)
Enrique CASTILLO (Spain)	Jaroslav POKLUDA (Czech Republic)
Xu CHEN (China)	Sylvie POMMIER (France)
Lech DIETRICH (Poland)	Narayanaswami RANGANATHAN (France)
Jaime DOMÍNGUEZ (Spain)	Hans RICHARD (Germany)
Alfonso FERNANDEZ-CANTELI (Spain)	Masao SAKANE (Japan)
Emmanuel GDOUTOS (Greece)	Manuela SANDER (Germany)
Grzegorz GLINKA (Canada)	Andrzej SEWERYN (Poland)
M. Neil JAMES (England)	Giora SHATIL (UK)
Erland JOHNSON (Sweden)	Małgorzata SKORUPA (Poland)
Dorota KOCĄNDA (Poland)	Jussi SOLIN (Finland)
Arnold KRASOWSKY (Ukraine)	Ramasubbu SUNDER (India)
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Paolo LAZZARIN (Italy)	Laszlo TÓTH (Hungary)
Gyöngyvér LENKEY (Hungary)	Valery TROSHCHENKO (Ukraine)
Tadeusz ŁAGODA (Poland)	Stefan VODENICHAROV (Bulgaria)
Gary MARQUIS (Finland)	Michael VORMWALD (Germany)
Hryhoriy NYKYFORCHYN (Ukraine)	P. V. YASNIY (Ukraine)

Organizing Committee

Prof. Ewald MACHA, *chairman*
Ph.D., D.Sc. Dariusz ROZUMEK, *secretary*
Dr. Zbigniew MARCINIAK
Dr. Grzegorz ROBAK
Magdalena FILIPEK, M.A.
Joanna DROZD, M.A.
Małgorzata NOWICKA, M.A.

AIM AND SCOPE

The aim of the Colloquium is to provide an opportunity to share information and facilitate international co-operation in the field of fatigue of metals and disseminate current research results in this multi-discipline.

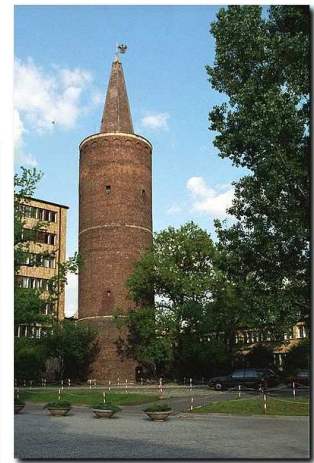
English will be the official language of the conference.

THE MAIN TOPICS OF THE COLLOQUIUM:

- *Physical and phenomenological approaches to the description of the fatigue damage,*
- *Environmental (corrosive medium, temperature, loading waveform, etc.) effects on fatigue crack propagation,*
- *Fatigue strength with allowance for the effect of manufacturing and service factors,*
- *Fatigue life of machine components,*
- *Variable amplitude loading,*
- *Mixed mode fatigue and fracture,*
- *Multiaxial fatigue,*
- *Fatigue modelling and simulation,*
- *Software for life prediction,*
- *Testing and applications.*

CONFERENCE VENUE

XV-ICMFM 2010 will take place in Opole University of Technology (Poland). Opole is an urban city and the capital of Opolskie Voivodeship. It is one of the oldest settlements in Poland, situated in the south of Poland. Due to the location of Opole region, today a part of Silesian Lowland, the first settlers appeared in the Middle Ages. The favorable defensive conditions, the swampy left-bank of the Odra River and the intersection of the old trade routes made the region an attractive location. The first reference to Opole, the town situated on the Odra River, appeared in the second half of the 9th century. The history of Opole is related to Duke Casimir - the grandson of Ladislaus the Wrymouthed; it was during his reign that the city was chartered (beginning of the 13th century) and in 1283 Opole became the capital of the Duchy. The fortified castle situated on Pasieka Island was the Duke's property. Located at the point where important European trade routes meet, Opole has always been a major junction in this part of Europe.



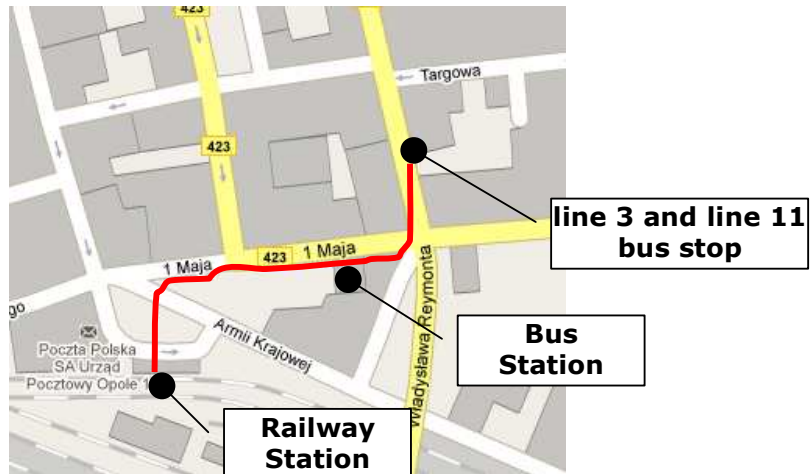
Photos from [Wikipedia](#) under [GNU Free Documentation License](#)
Thanks to authors: Bartek Wawraszko, Kaww

TRAVEL INFORMATION

The nearest airports are in Wrocław, Katowice and Kraków. Opole has very good roads (especially motorway) and railway connections to those cities.

City bus to Conference Centre:

- ❑ **line 3** – bus stop **1 Maja** (near Railway Station and Bus Station) direction **Pużaka – Pętla** (**Pużaka - terminus**); price of ticket 2.30 PLN (sold by bus driver: 2,60 PLN); travel time approx. 20 min; to get off on **Mikołajczyka** bus stop.
- ❑ **line 11** – bus stop **1 Maja** (near Railway Station and Bus Station) direction **Pużaka – Pętla** (**Pużaka - terminus**); price of ticket 2.30 PLN (sold by bus driver: 2,60 PLN); travel time approx. 15 min; to get off on **Sosnkowskiego - Politechnika** bus stop.



The conference will take place at the new building behind the Student Hostels by Mikołajczyka Str.





Campus of Opole University of Technology (Politechnika Opolska).

CONFERENCE OFFICE

XV International Colloquium Mechanical Fatigue of Metals

*Opole University of Technology
Faculty of Mechanical Engineering
Department of Mechanics and Machine Design
ul. Mikołajczyka 5, 45-271 Opole, Poland
tel.: (+48 77) 4006134, fax: (+48 77) 4006343
e-mail: e.macha@po.opole.pl*

*Conference website:
www.cesti.po.opole.pl/XV-icmfm*

CONFERENCE FEE

After 30-06- 2010

Participant 350 €
Postgraduate student 250 €
Accompanying person 150 €

The conference fee includes: book of abstracts and proceedings on CD (excluding accompanying persons), participation in all sessions and conferences events (lunches, coffee breaks, welcome reception, barbecue and selected excursion). After the conference the full papers will be published in the international journals:

1. International Journal of Fatigue, Elsevier
2. Physicochemical Mechanics of Materials - Materials Science, Springer, New York
3. Problems of Strength - Strength of Materials, Springer

If the paper is not accepted by the Scientific Committee and its author resigns his participation in the Conference for this reason, the fee will be transferred back. In any other cases of resignation, a handling charge 50 € will be deducted. After 10th August, 2010 the fee will not be repaid.

The conference fees should be transferred to:

Currency: **EURO** only

Account holder: **Polish Society of Theoretical and Applied Mechanics (PTMTS), Opole**

Address: **ul. Mikolajczyka 5, 45-271 Opole**

Bank name: **Millenium Bank S.A.**

Bank address: **ul. 1 Maja 6, 45-068 Opole, Poland**

IBAN: **PL 33 1160 2202 0000 0001 4850 1390**

SWIFT CODE: **BIGBPLPW**

*Please, add your name and the abbreviation
XV-ICMFM.*

In exceptional cases the conference fee can be paid in Secretary Office in Opole.

ACCOMMODATION AND EVENTS

The organizers offer accommodation in **Hotel FESTIVAL**(near the Conference Center).

Hotel Festival
ul. Oleska 86
45 - 222 Opole

Reception:

tel. +48 77 427 55 55, 442 33 33

fax: +48 77 427 55 19

e-mail: repcja@festival.com.pl

www: <http://www.festival.com.pl/en/>

Walking distance to the Conference Venue: ca. 10 min.

Conference participants will receive special, reduced rates - prices from 225 zł/ per night.

For detailed information, please contact Hotel Festival directly and, in all your correspondence refer to: **MFM 2010**.

Note:

- Hotel Festival offers single, double and quadruple (family) rooms.
- Reservations will only be accepted in a written form (e-mail, fax);
- Discount offer is available until 10.08.2010;
- Reservations should include:
 - date of arrival and departure,
 - room type;
 - personal information: full name, address, company details for VAT invoice,
 - credit card information: for pre-authorisation the cost of the first night stay will be charged;
 - For reservations made without using a credit card, pre-payment covering the cost of the first night stay is required (the hotel issues pro-forma invoices).

Breakfast is included in the room price. Using the swimming-pool, jacuzzi and fitness room is also free of charge. All rooms are equipped with paid mini-bars. Car parks are available at the following prices: monitored 20 zł/day, guarded 30 zł/day.

Apart from the hotels in the city, organizers also suggest to consider booking cheap rooms in the University Hotel:

Sokrates Hostel
ul. Malopolska 22
45-301 Opole

tel. +48 77 457 65 40
tel./fax +48 77 455 75 04

Walking distance to the Conference Venue: ca. 20 min.

Prices:

- single room – 50zł+7%Vat;
- place in a double room – 40 zł+7%Vat;
- place in a triple room – 30 zł+7%Vat;
- single room with a bathroom – 70 zł+7%Vat;
- single room with bathroom and kitchen facility – 90 zł+7%Vat;

Please note that 7% VAT will be added to the given prices.

Prices are guaranteed **until 30 June 2010**. Payment can only be made in cash (Polish zloty) on the arrival.

Breakfast is not included in the price.

It is, however, available on request at University Canteen near the Conference Venue between 13-15 September 2010. The breakfast price is 12 zł; per serving, paid in cash in the Canteen. If you wish to arrange your breakfast, please email: e.macha@po.opole.pl .

EXCURSIONS

The organizers provide an excellent opportunity to have a dinner in the hunting atmosphere (barbecue). During the dinner there also will be an opportunity to encounter traditional Polish manufactures (such as painting Easter eggs, sculpting in the wood, lace making, pottery and many more attractions) as well as purchase some of the best Polish souvenirs.

Excursion No. 1: It will be also possible to visit the Memorial and the Museum Auschwitz-Birkenau where the permanent exhibition of Auschwitz I Main Camp is located and to see the most important remainings of the camp objects at Birkenau.

Excursion No. 2: For those who would like to explore coal mine, we provide excursion to a unique coal mine GUIDO in Zabrze. Participants will go underground on depth 320 m.

PROGRAMME

Attention: All plenary and oral sessions **A1 – A9** will take place in **Hall E** (First floor)
Poster Session will be placed in **Main Hall**.

12.09.2010 (Sunday)

18:00 – 19:00 **Participants registration**

19:00 – 21:00 **Get together**

13.09.2010 (Monday)

8:00 - 9:15, Participants registration - Main Hall

9:15 - 10:00, OPENING OF THE COLLOQUIUM - Hall E

10:00 - 10:40, Plenary session:

Valery T. TROSHCHENKO: Cyclic inelasticity and high-cycle fatigue of metals with consideration of the stress gradient effect

10:40 – 11:00 Coffee break

11:00 – 12:00

Oral session A1: Physical and phenomenological approaches to the description of fatigue damage

1. Shigeru HAMADA, Hiroshi NOGUCHI, Yuu SAKODA, Masaharu UEDA: Fatigue strength evaluation method of lamellar pearlite rail steel
2. Komei HAYASHI, Shigeru HAMADA, Hiroshi NOGUCHI: Proposal of distribution characteristic evaluation method of flaky inclusion (examination by simulation)
3. Mikchail KARUSKEVICH, Oleg KARUSKEVICH, Tatiana MASLAK, Sergey SCHEPAK: Extrusion / intrusion structures as quantitative indicators of accumulated fatigue damage

12:00 – 13:00

Oral session A2: Fatigue modelling and simulation

1. Martin ŠEVČÍK, Pavel HUTAŘ, Michal ZOUHAR, Luboš NÁHLÍK: Numerical determination of the crack front shape for specimen with finite thickness
2. Jiří MAN, Ivo KUBĚNA, Anja WEIDNER, Tomáš VYSTAVĚL, Tomáš KRUML, Jaroslav POLÁK: Study of cyclic strain localization and fatigue crack initiation using FIB technique
3. Volker LANDERSHEIM, Michael JÖCKEL, Chalid EL DSOKI, Thomas BRUDER, Holger HANSELKA: Fatigue strength evaluation of linear flow split profile sections based on hardness distribution

13:00 – 14:10 Lunch

14:10 – 16:10

Oral session A3: Testing and applications

1. Antonio ARGÜELLES, Pelayo FERNÁNDEZ, Alfonso FERNÁNDEZ-CANTELI, Margarita CANALES, Enrique CASTILLO: Checking the fatigue limit from thermographic techniques by means of a probabilistic model of the $\varepsilon - N$ field
2. Marek SMAGA, Dietmar EIFLER: Influence of the machining induced near surface morphology on the fatigue behavior of an aluminum matrix composite
3. Jaroslav POLÁK, Jiří MAN: Fatigue behaviour of ferritic-pearlitic-bainitic steel in loading with positive mean stress
4. Janusz MIERZYŃSKI, Volodymyr HUTSAYLYUK: The micromechanism of fatigue cracking of the D16 aluminium alloy elements with a calibrated hole subject to bending
5. Edson Costa SANTOS, Katsuyuki KIDA, Takashi HONDA, Hitonobu KOIKE, Justyna

ROZWADOWSKA: Fatigue strength improvement of AISI E52100 bearing steel by induction heating and repeated quenching

6. Martin PETRENEC, Tomáš KRUML, Jaroslav POLÁK, Miroslav ŠMÍD, Petr BUČEK, Karel OBRTLÍK: Cyclic plasticity and strain localization of fatigued cast γ -TiAl based alloy at room temperature

16:10 – 16:30 Coffee break

16:30 – 17:50

Oral session A4: Fatigue modelling and simulation

1. Ewald MACHA, Adam NIESŁONY: The fatigue life models of materials and structures under multiaxial random loading – the state-of-the-art and directions of future research work
2. Artur JANKOWIAK, Hieronim JAKUBCZAK: Modeling of fatigue crack growth in plates under arbitrary mode I stress
3. Łukasz BLACHA: Comparison of energetic model approach to international recommendations for fatigue analysis of welded joints
4. Yongfeng LIANG, Yuanyuan XIANG, Xu CHEN: Multiaxial ratcheting-fatigue properties of Sn-3Ag-0.5Cu solder

18:00 – 20:00 WALKING CITY TOUR

14.09.2010 (Tuesday)

9:00 – 9:40, Plenary session:

Roberto BRIGHENTI, Andrea CARPINTERI, Sabrina VANTADORI: A multiaxial fatigue approach based on damage mechanics

9:40 – 10:40

Oral session A5: Physical and phenomenological approaches to the description of fatigue damage

1. Katsuyuki KIDA, Edson Costa SANTOS, Takashi HONDA, Hitonobu KOIKE, Justyna ROZWADOWSKA: Observation of magnetic flux density around fatigue crack tips in bearing steel using a SHPM with a three-dimensional small-gap probe
2. Dorota KOCAŃDA, Michał JASZTAL, Henryk TOMASZEK: Probabilistic predicting the fatigue crack growth under variable amplitude loading
3. Hryhoriy NYKYFORCHYN: Effect of exploited dissipated damage on the regularities of the properties degradation of engineering steels

10:40 – 11:00 Coffee break

11:00 – 12:00

Oral session A6: Fatigue modelling and simulation

1. Stanislav SEITL, Alfonso FERNÁNDEZ-CANTELI: Analyzing some mode-II and mixed-mode aspects using a tensor model
2. Jerzy OKRAJNI: Models of components in the evaluation of their local strength and fatigue conditions under mechanical and thermal loading
3. Petro YASNIY, Volodymyr HLADO, Sergiy FEDAK, Igor SHULHAN: Simulation of limit state of Al-6%Mg alloy under combined load with taking into account material microstructure

12:00 – 13:00

Oral session A7: Fatigue life of machine components

1. Arezou ABIAZY, Alireza EBRAHIMI: Inclusions, small cause having large effects on mechanical properties of steel
2. Anna AMVROSIEVA, Victor MUSALIMOV: Fatigue fracture of miniature piezoelectric grabs
3. N. A. AKEEL, M. A. AZIMAN, Z. SAJURI, A. K. ARIFFIN and A. W. IKHSAN: Analysis the stress distribution of wheel/rail contact

13:00 – 14:10 Lunch

14:10 – 15:50

Oral session A8: Fatigue modelling and simulation

1. Marta KUREK, Tadeusz ŁAGODA, Piotr WARMUZEK: Determination of stress and strain distributions in elastic-plastic materials under bending and torsion
2. Andrzej KUREK: Classification of some selected constructional materials considering theoretical assumptions of the fatigue curve models

Oral session A9: Testing and applications

1. Alexander BOGDANOVICH, Ivan LIS: Experimental research of back effect for mechano-sliding fatigue of the 0,45% carbon steel - siluminum active system
2. Alexander BOGDANOVICH, Vadim VESELYKHA: Effect of long time operation on cyclic crack growth resistance for material of tubes of line parts of an oil pipeline "DRUZHBA"
3. Alexander BALITSKII, Victor VYTVYTSKYII, Ljubomyr IVASKEVICH: The high- and low-cycle fatigue strength of Ni-contain steels and alloys in high pressure hydrogen

15:50 – 16:10 Coffee break

16:10 – 17:10

Poster session, Main Hall

1. V.T. TROSHCHENKO, L.A. KHAMAZA: The fatigue limits of steels and stress gradient
2. Georgii V. TSYBAN'OV, Andrey I. NOVIKOV: Maximum hardening model of material for fatigue-crack initiation onset and determination of its parameters
3. Zbigniew DOMAŃSKI, Tomasz DERDA: Voronoi tessellation description of load transfer within the fibres bundle model of two dimensional damage
4. Adam LIPSKI, Stanisław MROZIŃSKI: Selected methods for approximate determination of a strain-controlled fatigue life curve for aluminium alloy sheets for aircraft structures
5. Stanisław MROZIŃSKI, Adam LIPSKI: Elaboration method of low – cycle fatigue tests
6. Dariusz ROZUMEK, Maria HEPNER: Influence of oxygenation time on fatigue crack growth in the alloy Ti-6Al-4V
7. Dariusz ROZUMEK, Zbigniew MARCINIAK: Fatigue crack growth of specimens with rectangular cross-sections under out-of-phase bending and torsional loading
8. Grzegorz LESIUK, Mieczysław SZATA: Aspects of structural degradation in old bridge steels by means of fatigue crack propagation resistance
9. Krzysztof WERNER: The investigation of crack growth and crack opening displacement in higher strength steel under fatigue loading
10. Grzegorz ROBAK: Influence of C and m coefficients on description of the fatigue crack propagation rate and the fatigue life
11. Kyong-ho CHANG, Gab-chul JANG: Low cycle fatigue behavior of welded stainless steel pipe for loading frequency
12. Kyong-ho CHANG, Gab-chul JANG: Residual stress variation of weld joint in stainless steel pipe under various low-cycle fatigue loadings
13. Hamid SEDJAL, Samir OUARI, Fatah HELLAL: Experimental and numerical study of the fatigue of an aluminium alloy into seawater

17:10 – 17:25 CLOSING OF THE COLLOQUIUM

18:00 – 22:00 CONFERENCE DINNER

15.09.2010 (Wednesday)

EXCURSION

**GUIDO Coal Mine
(departure 8:30)**