

## **In memory of Mladen Berković**

The development of fracture mechanics in our region is closely related to the organisation of International fracture mechanics summer school (IFMASS), where the contribution of Professor Mladen Berković was of great significance.

Professor Michael Wnuk (University of South Dakota, Brookings, now at University of Wisconsin, Milwaukee) spent his sabbatical in 1980 in Belgrade, as a guest of Prof. Stojan Sedmak at the Faculty of Technology and Metallurgy. After a successful half-year sojourn, during which an important development in fracture mechanics in our region had been achieved, Prof. Wnuk proposed organising a Fracture Mechanics Summer School, at which invited lecturers would present state-of-the-art fracture mechanics applications and possibilities. The first problem of School organisation was financial, and it was solved by the acceptance of Mr. Tihomir Tošić, the manager of GOŠA Industry in Smederevska Palanka to be the sponsor, enabling the location of the School in Smederevska Palanka. The second problem was in the lecturing staff. The School was conceived to last one week, and at least 20 lectures were required. Professor Wnuk invited Mohan Ratwani from USA (who presented 5 lectures), and Adam Mazur from Poland (2 lectures), Andrej Neimitz, Janus Orkis and Andrej Jaworsky, and with the 2 lectures of Prof. Wnuk summed up to 12. Eight more lectures were necessary to achieve the planned 20. Jože Pirš from Rijeka was also invited, Milan Radojković, Aleksandar Radović (2 lectures), Ljubomir Nedeljković and Stojan Sedmak, resulting in 6 more lectures.

Considering the situation, Prof. Wnuk had proposed to invite Dr. Berković. My response was that we can't do this, since Berković is in Israel and we did not know him. Professor Wnuk replied that another person must be in question, since Dr. Berković defended his doctoral thesis in fracture mechanics and must be in Yugoslavia, so he should be invited. I addressed to Dr. Aleksandar Radović, director of Military Technical Institute (VTI) at the time. The response was negative, but he promised he would find out. Two days later he called and informed me that in the Aeronautical Institute Dr. Mladen Berković was engaged in the field of fracture mechanics and numerical analysis. After that it was easy. I invited Dr. Berković to join us as a lecturer at the Summer School, and so he accepted. In the talks that followed, it turned out to be beneficial to also invite Prof. Jovo Jarić from the Faculty of Sciences, interested in fracture mechanics theoretical aspects. Jovo Jarić also accepted our invitation, and the list of lecturers at the First International Fracture Mechanics Summer School was completed. Since that time, close cooperation in fracture mechanics development and structural integrity assessment followed. The established cooperation led to writing a joint paper, as an invited lecture "Problems in fracture mechanics" by S. Sedmak, J. Jarić and M. Berković, presented at 15<sup>th</sup> Yugoslav Congress of Theoretical and Applied Mechanics, held in Kupari in 1981. The cooperation had particularly been enhanced since Mladen Berković joined the Faculty of Sciences in Belgrade, 1987.

In the course of organising IFMASS 7, Aleksandar Sedmak (who had accomplished his doctoral thesis in the meantime and supervised by M. Berković and J. Jarić) had asked me whether I noticed the lecturer who had participated in all Fracture Mechanics Summer Schools to date. I responded that this must be M. Wnuk. However, it turned out that Mladen Berković had lectures also at all of the seven Summer Schools. Through his lectures it is possible to follow the development of numerical methods in fracture mechanics, and so we will cite them here:

M. Berković: "Determination of Stress Intensity Factors Using Finite Element Method"  
(IFMASS 1: "Introduction to Fracture Mechanics and Fracture-Safe Design")

M. Berković: "Problems of Plane and Triaxial Stress States in Pressure Vessels and Pipelines"  
(IFMASS 2: "Modern Aspects of Design and Construction of Pressure Vessels and Penstocks")

M. Berković, S. Maksimović, A. Sedmak: "Analysis of Welded Joints by Applying the Finite Element Method"  
(IFMASS 3: "Fracture Mechanics of Weldments")

M. Berković, A. Sedmak: "Finite Element Method Application in Calculation of Thin Shell J Integral"  
(IFMASS 4: "Prospective of Fracture Mechanics Development and Application")

M. Berković, A. Sedmak, J. Jarić: "C\* Integral – Theoretical Basis and Numerical Analysis"  
(IFMASS 5: "The Application of Fracture Mechanics to Life Estimation of Power Plant Components")

A. Sedmak, M. Berković, N. Savović: "Numerical Analysis of Surface Crack Problems in Pressure Vessels"  
(IFMASS 6: "Service Cracks in Pressure Vessels and Storage Tanks")

M. Berković: "Finite element method and its application in crack analysis"  
(IFMASS 7: "Experimental and Numerical Fracture Mechanics Methods in Structural Integrity Assessment")

Since these lectures represent a significant contribution to the development of fracture mechanics and structural integrity assessment it has been concluded that their translation to English will enable a possibility of better acquaintance to the work of Mladen Berković. This issue of our journal presents his lectures from IFMASS 1 to 4 and IFMASS 6 are, compiled with the chapter written by M. Berković in the paper "Problems in fracture mechanics." However, his lecture from the IFMASS 5 is not presented here since it has been already published in English in our monograph in 1990 (Published by EMAS).

Unfortunately, the lecture of M. Berković held at IFMASS 7 was not published in that monograph. During the time of print preparation Prof. Mladen Berković suddenly died. We devote this issue to his memory.

The Society for Structural Integrity and Life (DIVK) which in cooperation with the Institute for Material Testing publishes our journal Structural Integrity and Life, was established in 2001. DIVK members had gathered within the International Fracture Mechanics Summer School (IFMASS) in the period before its founding, whence they had a chance to be acquainted with Prof. Mladen Berković and his contribution to development of fracture mechanics. The contribution of Prof. Mladen Berković is certainly of great importance in the foundation of DIVK.

*Prof. dr Stojan Sedmak*