In Memoriam Prof. Dr. Jindřich Nečas

I feel deeply honored and I am very grateful being invited to this memorial conference for Jindřich Nečas. I express my sincere sympathy to his family, to his friends and colleagues here in Prague, and to the whole community of mathematicians for this big loss of a great man.

I met Jindřich Nečas for the first time during one of my visits of Jan Poláček or Josef Král in the seventies. I still remember an occasion when we met one of his students who was expelled from the university, how Jindřich Nečas was encouraging and helping him not to give up hope and mathematics either. Mathematically I have found his traces and influence almost everywhere. When I was working on the weak and variational formulation of boundary integral equations I have tremendously enjoyed his proof of Gårding's inequality for positive elliptic systems of partial differential equations in the sense of Vishik and Schechter in his French book on elliptic partial differential equations [1], and nowhere else I could find a better treatment of Lipschitz boundaries.

When I met him in person I was very astonished since I thought him at least twenty years older having published such a wonderful book. And when I got to know him more closely, I found a great, tolerant, humorous, humanitarian friend. Several times he listened to my humble lectures and then he would say 'Wolfgang, this is nice work' (he was always encouraging), and his sensitive criticism was always extremely friendly and helpful. In fact, due to his work, two major parts of my own work were motivated. His paper with Miloslav Feistauer and Jan Mandel on transonic potential flow [2] started related work in Stuttgart for more than fifteen years. From 1987 till 1996 supported by the Stiftung Volkswagenwerk and till 2002 by the Deutsche Forschungsgemeinschaft, in Stuttgart worked G. Warnecke, H. Berger, T. Sonar, U. Göhner, J. Felcman, C. Coclici and Gh. Moroşanu on various related topics, such as a priori error analysis for finite element approximations to transonic flow, error indicators and shock indicators driving adaptivity, a posteriori error estimates, the Kutta–Joukowski condition, far–field Prandtl–Glauert coupling via the Dirichlet–Neumann map with boundary integral equations and, finally, the modelling of magneto–plasmadynamic flows on which I shall report in a few minutes.

Also Jindřich Nečas' work on contact with friction with J. Jarušek and J. Haslinger [3] initiated investigations on this topic in Stuttgart which motivated Christof Eck for his joint work with Dr. Jarušek. From 1993 till today, the Deutsche Forschungsgemeinschaft supported the work by C. Eck, M. Maischak, H. Guediri, M. Bach, H. Schulz, O. Steinbach and Y. Jiang with whom existence and convergence of the penalty approximation of quasistatic contact with friction via boundary element methods was shown and enriched by error estimates driving adaptivity in 2D and 3D. Then we could also approximate the active contact area and recently, we even can treat dynamic contact with friction.

While Jindřich Nečas was in Stuttgart giving a course on micropolar fluids to our graduate college students he encouraged Christof Eck and Cristian Coclici and helped them with many discussions and advice; they both send their cordial greetings and express their mourning sympathy.

Let me now return to recent work on the magneto–plasmadynamic space thrusters. Although this was initiated by the colleagues of the Institute of Space Systems at the University of Stuttgart who operate a corresponding test installation, without Cristian Coclici's visits to Prague and the cooperation with Professors M. Feistauer, J. Felcman, E. Feireisl and Jindřich Nečas this work had never been started. The following lecture "On the mathematical modelling of self–field MPD–Thrusters" [4] is dedicated to the memory of Jindřich Nečas.

Without the long lasting cooperation and friendship with Jindřich Nečas and all my friends in Prague, much of my work would not exist at all.

Jindřich Nečas has brought all of us here together; and as Professor Jäger already said — this is a large family — missing him very, very much.

Prague, March 29, 2003   Wolfgang Wendland

References

[1] J. Nečas: Les Méthodes Directes en Théorie des Equations Elliptiques. Masson, Paris/Academia, Prague, 1967.

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[3] J. Nečas, J. Jarušek, J. Haslinger: On the solution of the varational inequality to the Signorini problem with small friction. Bollettino U.M.I. **17** (1980) 795–811.

[4] C. Coclici, J. Heiermann, Gh. Moroşanu, W.L. Wendland: On the mathematical modelling of self–field MPD thrusters. Bericht 2002/16, SFB 404, Universität Stuttgart 2002 (submitted).