11. TMP

International Conference
on
Recent Advances
in
Analytical and Numerical Treatment
of
Operator Equations

in memory of Prof. Siegfried Prößdorf

Organized by

Department of Mathematics, Technical University of Chemnitz
and
Weierstrass-Institute for Applied Analysis and Stochastics, Berlin

March 25 - 28, 1999
Hotel Wasserschloß Klaffenbach
Chemnitz, Germany
Obituary

Prof. Dr. rer. nat. habil. Siegfried Prößdorf


For me, as for many colleagues in Germany and abroad, the news of Siegfried Prößdorf’s death was so shocking as to be unfathomable. Only now, little by little, are its implications becoming clearer. We have lost one of the most prolific mathematicians that ever worked in the area of integral equations and their numerical analysis. It is not possible to fully describe his life and his scientific work in the few broad strokes to which I am restricted here. The course of his career was decidedly influenced by his undergraduate studies at the Department of Mathematics of Leningrad University from 1958 to 1963 and subsequent graduate work there from 1963 to 1966. Fichtenholz, Natanson, Smirnow, and other excellent mathematicians were his lecturers. In particular the influence of Professor Salomon Michlin on Siegfried Prößdorf’s work cannot be overestimated. In the 1960s various classes of convolution equations whose generating functions have zeros and thus violate normalization conditions became the object of intense study. Michlin steered Prößdorf’s interest towards this area, became his graduate mentor and remained his lifelong friend and collaborator. Upon his graduation in 1966, Prößdorf accepted a position at the Institute of Mathematics at the Technical University Karl-Marx-Stadt (now Technical University of Chemnitz). It was my good fortune to become an Assistant in his group in 1967. His extraordinary talents were demonstrated in his habilitation thesis in 1967 and finally in his advancement to tenure in 1969. In addition Professor Prößdorf showed himself to be an exemplary teacher and organizer. He built up a flourishing research team and enthusiastically involved himself in teaching. Prößdorf’s lectures in analysis are well remembered to this day. They set the high standards that the Department of Mathematics of the Technical University of Chemnitz feels its duty to maintain.

In the late 1960s and early 1970s tensions arose in the Department of Mathematics due to contrary interpretations of the role of mathematics within the natural sciences and within society. Siegfried Prößdorf, with characteristic determination and integrity, maintained the position that mathematics is indivisible and that its course of progress is determined by its own innate logic and dynamics. Nevertheless, he certainly did not deny the importance of external influences as stimulating and enriching. For example, he considered computer technology as being a means to raise the applicability of mathematical methods to completely new levels.

In the early 1970s, although the potential for conflict at the Department of Mathematics in Karl-Marx-Stadt kept increasing, Siegfried Prößdorf’s reputation outside of Karl-Marx-Stadt grew steadily. These developments lead him to seek a suitable position elsewhere. As I understand it, he received various offers from the then GDR Academy of Sciences and finally, in 1975, moved reluctantly to Berlin. Prior to that, in 1972-73, he was a guest professor at the Institute of Mathematics of the Academy of Sciences in Kishinev (Moldavia). This period of his life brought two important developments: For one, Prößdorf wrote his first book, which was later quite well respected and widely distributed. The second is his acquaintance and developing friendship with Israel Gohberg, whose scientific work was for Prößdorf’s research group as significant as that of Salomon Michlin. Stimulated by Israel Gohberg’s suggestions, in 1973-74 Siegfried Prößdorf and I began working on our own problems in Numerical Analysis. The scope of these investigations grew steadily and influenced his entire scientific activities at the Weierstraß Institute in Berlin. In the mid 1970s he had his first contacts with Professors Meister and Wendland who at the time were still working in Darmstadt. They, too, in difficult
times, proved to be good friends and colleagues. Wolfgang Wendland suggested to Prößdorf that he explore applications of spline approximations to boundary integral equations. Together with his coworkers in Berlin, he earned lasting honors for his work in this area, of which a representative example is the application of Mellin techniques in Numerical Analysis.

As I already mentioned, respect for Siegfried Prößdorf’s contributions grew with each passing year. His list of publications comprises 130 refereed papers and five books. He gave innumerable lectures at international conferences and other occasions and was on the editorial boards of four respected mathematical periodicals. He richly deserved the National Prize, which he won in 1980.

Siegfried Prößdorf leaves behind a school in which not only his own students but also their progeny continues to work. The course that he laid is clear and leads to the future. Despite his personal importance as a scientist, he remained modest, tolerant, and supportive.

I recall with pleasure my many visits to Roswitha and Siegfried Prößdorf, our discourses, and the sincere empathy shown by him for the manifold problems that we, his friends, colleagues and students, shared with him. His open and congenial manner, and his commitment, won him many friends.

His early death leaves an emptiness that, in my mind and heart, can never be filled.

We are reaping today that which Siegfried Prößdorf sowed many years ago. His life and work tell us that this process needs continuous renewal. We honor him best when we follow these ideas.

Bernd Silbermann

Chemnitz, March 1999
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<td>Opening Address: E. Lauckau, Technische Universität Chemnitz</td>
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<td>9:00 - 9:55</td>
<td>I. Gohberg, Tel Aviv University State space method in problems of Mathematical Analysis</td>
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<td>10:00 - 10:45</td>
<td>I. H. Sloan, The University of New South Wales Local principles for the qualocation method</td>
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<td>11:05 - 11:50</td>
<td>S. Roch, Technische Universität Darmstadt Fractality - a property which makes approximation processes uniform</td>
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<td>11:05 - 11:50</td>
<td>A. Böttcher, Technische Universität Chemnitz The spectrum of the Cauchy singular integral operator</td>
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<td>G. Heinig, Kuwait University Superfast algorithms for Toeplitz and Toeplitz-plus-Hankel systems</td>
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<td>14:35 - 15:05</td>
<td>N. Vasilevski, National Polytechnic Institute, Mexico Bergman-Toeplitz operators: a pseudodifferential approach</td>
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<td>15:10 - 15:40</td>
<td>Yu. Karlovich, Instituto Superior Técnico, Lisboa Singular integral operators with finite groups of shifts and slowly oscillating data</td>
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<td>V. S. Rabinovich, National Politechnic Institute, Mexico Operators of potential type on curves with vorticity points</td>
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<td>16:35 - 17:05</td>
<td>R. Duduchava, A. Razmadze Mathematical Institute Boundary integral equations on curves with cusps</td>
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<td>17:10 - 17:40</td>
<td>V. V. Kravchenko, National Polytechnic Institute, Mexico On a new method for obtaining null-solutions of the Dirac operator</td>
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<td>14:00 - 14:30</td>
<td>M. Feistauer, Charles University, Praha On coupled procedures for viscous flow in exterior domains</td>
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<td>14:35 - 15:05</td>
<td>G. Gatica, Universidad de Concepcion Solvability and Galerkin approximations of a class of nonlinear operator equations arising in variational problems with constraints</td>
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<td>15:10 - 15:40</td>
<td>P. E. Ricci, Università degli Studi di Roma “La Sapienza” Iterative computation of eigenvalues of second kind Fredholm operators and applications</td>
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<td>16:00 - 16:30</td>
<td>S. N. Chandler-Wilde, Brunel University Solvability and numerical treatment of a class of integral equations on the real line</td>
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<td>16:35 - 17:05</td>
<td>G. Schmidt, WIAS Berlin Analysis and numerics for diffractive gratings</td>
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<td>17:10 - 17:40</td>
<td>Dao-Qing Dai, Zhongshan University Continuous solutions of a singular Vekua system</td>
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### Friday 26 March 1999

**Room: Bürgersaal**  
**Chairman: R. Schneider**

| 9:00 - 9:55 | W. Hackbusch, Max-Planck-Institut, Leipzig  
Hierarchical matrices |
|---|---|

**Parallel Sessions, Room: Bürgersaal**  
**Chairman: W. Hackbusch**

| 10:00 - 10:30 | F.-O. Speck, Instituto Superior Técnico, Lisboa  
Regularity Properties and Generalized Inverses of Delta-related Operators |
|---|---|
| 10:35 - 11:05 | I. Spitkovsky, College of William and Mary, Williamsburg  
On some convolution type equations |
| 11:25 - 11:55 | J. Saranen, University of Oulu  
Spline collocation for parabolic boundary integral equations |
| 12:00 - 12:30 | H. Brunner, Memorial University of Newfoundland  
Collocation methods for Volterra integral equations with proportional delays |

| 10:00 - 10:30 | P. Oswald, Bell Labs, Murray Hill  
Economical approximations for a model screen problem |
|---|---|
| 10:35 - 11:05 | V. Kozlov, Linköping University  
Asymptotics of solutions to semi-linear equations near boundary singularities |
| 11:25 - 11:55 | M. Efendiev, Freie Universität Berlin  
Orientable and nonorientable Riemann-Hilbert problems and their related CW-structures |
| 12:00 - 12:30 | L. von Wolfersdorf, TU Bergakademie Freiberg  
Potential flow past a porous circular cylinder |

### Memory Session, Room: Bürgersaal  
**Chairman: V. Maz’ya**

| 14:00 - 16:00 | J. Sprekels, WIAS Berlin  
Siegfried Prößdorf - A short review of his scientific career  
B. Silbermann, Technische Universität Chemnitz  
On some contributions of S. Prößdorf to the theory of singular operators of non-normal type  
W. Wendland, Universität Stuttgart  
Splines, finite elements, and integral equations |

| 16:30 - 17:00 | V. B. Dybin, Rostov State University  
The singular integral equations on $\mathbb{R}$ with $C^\infty_{\mathbb{R}}(\mathbb{R})$-coefficients |
|---|---|
| 17:05 - 17:35 | J. Elschner, WIAS Berlin  
On the conical diffraction problem for optical gratings |
| 17:40 - 18:10 | S. Handrock-Meyer, Technische Universität Chemnitz  
An inverse problem from 2D-groundwater modelling |

**Parallel Sessions, Room: von Taube**  
**Chairman: V. V. Kravchenko**

| 16:30 - 17:00 | W. Sprößig, TU Bergakademie Freiberg  
Hypercomplex methods for problems in fluid mechanics |
|---|---|
| 17:05 - 17:35 | K. Gürlebeck, Bauhaus-Universität Weimar  
On some classes of hypercomplex $P_t$-operators |
| 17:40 - 18:10 | S. M. Grudsky, Rostov State University  
Modelling oscillating functions by Blaschke products |
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<td>V. Maz'ya, Linköping University</td>
<td>Maximum principles for elliptic and parabolic systems</td>
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<td>10:00 - 10:45</td>
<td>G. C. Hsiao, University of Delaware</td>
<td>A domain integral equation method for the reconstruction of electromagnetic imaging</td>
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<td>11:05 - 11:50</td>
<td>R. Kreißig, Technische Universität Chemnitz</td>
<td>Identifikation von Materialparametern durch Auswertung von Spannungs- und Verschiebungsfeldern</td>
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<td>G. Vainikko, Helsinki University of Technology</td>
<td>Fast solvers of the generalized airfoil equation</td>
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<td>C. Bourgeois, Technische Universität Chemnitz</td>
<td>Multiscale methods for the heat equation</td>
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<td>Salim Meddahi, Universidad de Oviedo</td>
<td>A new approach to quadratures for BEM–FEM formulations in 2–d</td>
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<td>N. Karapetians, Rostov State University</td>
<td>Some classes of the multidimensional integral operators with homogeneous kernels</td>
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<td>16:00 - 16:30</td>
<td>G. Mastroianni, Università della Basilicata</td>
<td>Integral equations in some weighted Besov spaces</td>
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<td>16:35 - 17:05</td>
<td>G. Monegato, Politecnico di Torino</td>
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<td>I. G. Graham, University of Bath</td>
<td>Fast Integration in 3D Boundary Element Methods</td>
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<td>16:00 - 16:30</td>
<td>A.–M. Sändig, Universität Stuttgart</td>
<td>Local solvability and regularity results for a class of semilinear elliptic problems in nonsmooth domains</td>
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<td>16:35 - 17:05</td>
<td>J. Schult, Universität Kiel</td>
<td>Approximation and commutator properties of projections and applications to BEM</td>
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<td>T. Shaposhnikova, Linköping University</td>
<td>Maximal algebra in spaces of Sobolev multipliers</td>
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<td>10:00 - 10:45</td>
<td>A. Rathsfeld, WIAS Berlin</td>
<td>Wavelet collocation for integral equations</td>
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<td>11:05 - 11:50</td>
<td>M. Yamamoto, The University of Tokyo</td>
<td>Convergence rates of Tikhonov’s regularization solutions</td>
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<td>11:55 - 12:25</td>
<td>G. Bruckner, WIAS Berlin</td>
<td>Tikhonov regularization for a first kind integral equation with analytic kernel</td>
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**Parallel Sessions, Room: Bürgersaal**

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<td>U. Langer, Johannes Kepler Universität Linz</td>
<td>Scientific computing tools for 3D magnetic field problems</td>
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<td>R. Gorenflo, Freie Universität Berlin</td>
<td>Difference schemes of random walk type for space-fractional diffusion equations</td>
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<td>15:10 - 15:40</td>
<td>R. Plato, Technische Universität Berlin</td>
<td>Regularization of an inverse problem in groundwater filtration</td>
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<td>L. Jentsch, Technische Universität Chemnitz</td>
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<td>D. Natroshvili, Georgian Technical University</td>
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<td>15:10 - 15:40</td>
<td>H. Bremer, Johannes Kepler Universität Linz</td>
<td>Operator based motion equations</td>
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List of participants

Arens, T., Department of Mathematics and Statistics, Brunel University
Uxbridge, UB8 3PH, U.K.,

Bojarski, B., Institute of Mathematics, Polish Academy of Sciences,
ul. Śniadeckich 8, skrytka pocztowa 137, 00-950 Warszawa, Poland, im@impan.gov.pl

Böttcher, A., Fakultät für Mathematik, Technische Universität Chemnitz,
09107 Chemnitz, Germany, aboettch@mathematik.tu-chemnitz.de

Bourgeois, C., Fakultät für Mathematik, Technische Universität Chemnitz,
09107 Chemnitz, Germany, Christian.Bourgeois@mathematik.tu-chemnitz.de

Bremer, H., Mechatronik - Abteilung Robotik, Johannes Kepler Universität Linz,
A-4040 Linz, Austria, bremer@mechatronik.uni-linz.ac.at

Bruckner, G., Weierstrass-Institute for Applied Analysis and Stochastics,
Mohrenstr. 39, 10117 Berlin, Germany, bruckner@wias-berlin.de

Brunner, H., Memorial University of Newfoundland,
St. John’s, NF, Canada, hermann@math.mun.ca
Seminar für Angewandte Mathematik, ETH Zürich,
CH-8092 Zürich, Switzerland, brunner@sam.math.ethz.ch

Chandler-Wilde, S. N., Department of Mathematics and Statistics, Brunel University,
Uxbridge, UB8 3PH, U.K., Simon.Chandler-Wilde@brunel.ac.uk

Costabel, M., Institut Mathématique, Université de Rennes 1,
Campus de Beaulieu, 35042 Rennes Cedex, France,

Dai, Dao-Qing, Department of Mathematics, Zhongshan University,
Guangzhou, 510275 China, stsddq@zsu.edu.cn
Mathematisches Institut, Freie Universität Berlin,
Arnimallee 3, 14195 Berlin, Germany, dai@math.fu-berlin.de

Dresig, H., Fakultät für Maschinenbau, Technische Universität Chemnitz,
09107 Chemnitz, Germany,

Duduchava, R., A.Razmadze Mathematical Institute, Academy of Sciences of Georgia,
M. Alexidze str. 1, Tbilisi - 93, Georgia, duduch@rmi.acnet.ge

Dybin, V. B., Department of Mechanics and Mathematics, Rostov State University,
344711 Rostov-on-Don, Russia,

Efendiev, M., Fachbereich Mathematik und Informatik, Freie Universität Berlin,
Arnimallee 2-6, 14195 Berlin, Germany,

El schner, J., Weierstrass-Institute for Applied Analysis and Stochastics,
Mohrenstr. 39, 10117 Berlin, Germany, elschner@wias-berlin.de

Feistauer, M., Faculty of Mathematics and Physics, Charles University,
Malosraské nám. 25, 11800 Praha 1, Czech Republic, feist@ms.mff.cuni.cz

Gatica, G., Departamento de Ingeniería Matemática, Facultad de Ciencias Físicas y Matemáticas,
Universidad de Concepción, Casilla 160-C, Concepción, Chile, ggatica@ing-mat.udec.cl
Giebermann, K., Institut für Angewandte Mathematik, Abteilung für Wissenschaftliches Rechnen und Numerische Simulation, Universität Bonn, Wegelerstr. 4, 53115 Bonn, Germany, gieberma@iam.uni-bonn.de

Gohberg, I., School of Mathematical Sciences, Tel-Aviv University, Ramat Aviv 69989, Israel, gohberg@math.tau.ac.il

Gorenflo, R., Fachbereich Mathematik & Informatik, Freie Universität Berlin, Arnimallee 2-6, 14195 Berlin, Germany, gorenflo@math.fu-berlin.de

Graham, I. G., School of Mathematical Sciences, University of Bath, Bath BA2 7AY, U.K., I.G.Graham@bath.ac.uk

Grudsky, S. M. Department of Mechanics and Mathematics, Rostov State University, 344711 Rostov-on-Don, Russia, grudsky@aaaenet.ru

Gründemann, H., Fachbereich MPI, Hochschule für Technik und Wirtschaft Mittweida, Technikumplatz 17, 09648 Mittweida, Germany, hgruende@htwm.de

Gürlebeck, K., Institut für Mathematik/Physik, Bauhaus-Universität Weimar, Coudraystr. 13, 99421 Weimar, Germany, guerlebe@fossi.uni-weimar.de

Hackbusch, W. Max-Planck-Institut für Mathematik in den Naturwissenschaften Inselstr. 22-26, 04103 Leipzig, Germany, wh@mis.mpg.de

Handrock-Meyer, S., Fakultät für Mathematik, Technische Universität Chemnitz, 09107 Chemnitz, Germany, handrock@matematik.tu-chemnitz.de

Harbrecht, H., Fakultät für Mathematik, Technische Universität Chemnitz, 09107 Chemnitz, Germany, harbrecht@matematik.tu-chemnitz.de

Heinig, G., Department of Mathematics and Computer Sciences, Kuwait University, P.O. Box 5969, Safat 13060, Kuwait, georg@mcs.sci.kuwait.edu.kw

Heinrich, B., Technische Universität Chemnitz, 09107 Chemnitz, Germany, bernd.heinrich@matematik.tu-chemnitz.de

Horrocks, R., School of Mathematical Sciences, University of Bath, Bath BA2 7AY, U.K., maprah@maths.bath.ac.uk

Hsiao, G. C., Department of Mathematical Sciences, University of Delaware, Newark, DE 19716, USA, hsiao@math.udel.edu

Jentsch, L., Fakultät für Mathematik, Technische Universität Chemnitz, 09107 Chemnitz, Germany, lothar.jentsch@matematik.tu-chemnitz.de

Junghanns, P., Fakultät für Mathematik, Technische Universität Chemnitz, 09107 Chemnitz, Germany, peter.junghanns@matematik.tu-chemnitz.de

Karapetians, N., Department of Mechanics and Mathematics, Rostov State University, 344711 Rostov-on-Don, Russia, nkarapet@math.rsu.ru

Karlovich, Yu., Departamento de Matemática, Instituto Superior Técnico, Av. Rovisco Pais, 1049-001 Lisboa, Portugal, karlovic@math.ist.utl.pt

Khoromskij, B., Mathematisches Seminar II, Universität Kiel, Olshausenstr. 40, 24098 Kiel, Germany, bk@numerik.uni-kiel.de

Kirstein, B., Mathematisches Institut, Universität Leipzig, Augustusplatz 10/11, 04430 Leipzig, Germany,
Sprekels, J., Weierstrass-Institute for Applied Analysis and Stochastics, Mohrenstr. 39, 10117 Berlin, Germany, sprekels@wias-berlin.de

Sprößig, W., Fakultät für Mathematik und Informatik, TU Bergakademie Freiberg Bernhard-von-Cotta-Strasse 2, 09596 Freiberg, Germany, sproessig@math.tu-freiberg.de

Vainikko, G., Institute of Mathematics, Helsinki University of Technology, Otakaari 1 M, 02150 Espoo, Finland, gennadi.vainikko@hut.fi

Vasilevski, N., Department of Mathematics, CINVESTAV del I.P.N. Apartado Postal 14-740, 07000 Mexico, D.F., Mexico, nvasilev@math.cinvestav.mx

Weber, U., Fakultät für Mathematik, Technische Universität Chemnitz, 09107 Chemnitz, Germany, uwe.weber@mathematik.tu-chemnitz.de

Wegert, E., Fakultät für Mathematik und Informatik, TU Bergakademie Freiberg Bernhard-von-Cotta-Strasse 2, 09596 Freiberg, Germany, wegert@math.tu-freiberg.de

Wendland, W., Universität Stuttgart, Mathematisches Institut A, Pfaffenwaldring 57, 70569 Stuttgart, Germany, wendland@math.udel.edu

Wolfersdorf, L. v., Fakultät für Mathematik und Informatik, TU Bergakademie Freiberg Bernhard-von-Cotta-Strasse 2, 09596 Freiberg, Germany, wolfersdorf@math.tu-freiberg.de

Yamamoto, M., Department of Mathematical Sciences, The University of Tokyo, 3-8-1 Komaba, Meguro, Tokyo 153, Japan, myama@ms.u-tokyo.ac.jp