

The 6th International Symposium on Electromagnetic Compatibility and Electromagnetic Ecology, Saint Petersburg, Russia, June 21-24, 2005

By Professor Michel Ianoz, Symposium Vice-President and Professor Nikolay V. Korovkin, Symposium Technical Program Committee Chairman

Edited by Elya B. Joffe, EMC Society Membership Vice President

From June 21 to 24, 2005 as we traditionally do every two years since 1993, members of the EMC community from Russia and from a number of foreign countries met in Saint Petersburg. The venue of the Symposium was the Saint Petersburg Electrotechnical University (LETI).

The Organizers were:

- The Saint Petersburg Electrotechnical University (LETI)
- The Saint Petersburg Scientific and Technical Society of Radio Engineering
- The Leningrad Radio Research and Development Institute
- The "Discone-Center", a company that provides logistic support to the organization

The Symposium Chairman was the Rector of the LETI, Professor D.V. Puzankov; the Vice-Chairmen were Professor Michel Ianoz from Switzerland, and the corresponding member of the Russian Academy of Science, Yu. B. Zubarev.

The Organizing Committee was directed by the 1st pro-rector of LETI, Professor V.M. Kutuzov (Russia) and the work of the Program Committee was under the direction of Professor N.V. Korovkin from the Saint Petersburg State Polytechnical University.

Technical sponsors of the Symposium were the international organizations IEEE; including the EMCS, URSI, and the Russian company Proryv. URSI offered seven scholarships for the attendees. URSI and the Proryv Company financially supported the Symposium.

A group of international specialists in the field of EMC are actively involved in this Symposium; they not only attend the

Symposium and present papers, but take part in the organization and promotion of this Symposium from all over the world. We would like to emphasize the contribution of Professor M. Ianoz (Switzerland), Symposium vice-president, E. Joffe (Israel) Member of the Board of Directors of the EMCS, Professor M. Hayakawa (Japan) and Professors A. G. Mikerov, N. V. Korovkin, A. M. Kostrominov, G.G. Tchavka, Dr. A. A. Worshevski, the scientific secretary of the Symposium, Dr. S. B. Shostakovitch, the Director of the "Discone-Center", Dr. P. L. Asovitch, the Chairman of the A. A. Popov Society, and Dr. V.S. Gutin. We should also emphasize the attention which the Russian Academy of Science has given to this Symposium.

More than 150 scientists from 21 countries attended the Symposium. A third of them (49 persons) were from abroad. About half of the papers presented at the Symposium referenced work performed in laboratories abroad, or in cooperation with Russian specialists. The Proceedings of the Symposium have been published in English. The working languages of the sessions were English or Russian, with translation.

Additionally, 15 post-graduate students from Russia and from other countries also attended the Symposium.

All the participants have emphasized that there has been a noticeable increase in the scientific level of the Symposium over the years.

In parallel with the Symposium, an Exhibition was also organized, with the following companies presenting their products:

AR Worldwide (USA), EMV GmbH (Germany), Amideon Systems Ltd (Ireland), Kedah Electronics Engineering (Russia),



Professor D. V. Puzankov, LETI Rector, delivers his welcome address to the symposium participants.



Professor V. M. Kutuzov (Russia), Organizing Committee Chairman, delivers the opening speech of the Symposium. At his left is Professor M. Ianoz (Switzerland), Vice-President of the Symposium.



(From left) Elya Joffe (Israel and IEEE), M. Ianoz (Switzerland), Richard Rogers (Vice President, AR Worldwide), Professor Nikolay Korovkin (Russia), Zuzana Wood (EMV GmbH), Dr. Alexander Worshevsky (Russia) and Dr. Pavel Asovich (Russia), visit in the Amplifier Research (AR) Worldwide exhibit area.

Leningrad Radio Research and Development Institute (Russia), Research-and-production Enterprise "Proryv" (Russia), and TOR Ltd (Russia).

The exhibitors expressed their appreciation for the high professional interest of the Symposium participants in their products and also for the useful contacts and discussions they had during the Symposium.

The work of the Symposium was organized in 10 sessions, with topics that covered the most important problems of EMC today. During the Symposium, a workshop sponsored by the IEEE EMC Society, with the title "Shipboard EMC" also took place, where the main presentations were those of E. Joffe (Israel), M. Netzer (Israel), A. A. Worshevsky (Russia) and Professor K.H. Gonschorek (Germany).

Of particular interest were the lectures of the plenary session. The lecture by Professor Iu. G. Grigorev (Russia) discussed the danger of electromagnetic fields due to telecommunication antennas for the population. This is a controversial subject, which was followed by passionate discussions continued during the entire conference.

A vivid discussion followed also the lecture of Professor M. Ianoz and N.V. Korovkin on the progress in transmission of HF signals on low voltage distribution lines (the so-called topic of PLC or BPL) during the years 2003-2004. The third plenary lecture given by V.A. Tukhas on the development of Russian EMC measurement and test instrumentation was also received with high interest.

Before discussing the papers presented in the different sessions, we would like to say a few words about the very nice cultural program prepared by the Symposium organization not only for the companion program, but also for all the participants.

The Symposium presents two main advantages from this point of view: to be organized in Saint Petersburg, a town with museums, beautiful monuments, and well known palaces, and to be scheduled during the period of the "white nights". The companion program gave the possibility to visit the magnificent palace of the Empress Catherine the Great in the small town of Pushkin, a few kilometers from Saint Petersburg, where an incredible chamber with walls completely covered with amber was restored and was recently opened to the public. The program of the Symposium was scheduled in a way to permit all the participants to visit the summer palace of Peter the Great at

Peterhoff and the world famous Ermitage museum.

However, the most impressive moment of the cultural program was a cruise in the evening on the river Neva, when the setting sun was illuminating with its pale northern light the baroque facades of the palaces along the river and the towers of the Smolnyi monastery.

The 10 sessions of the Symposium were followed with great interest by the Russian and foreign scientists who attended the event. A short review of the papers presented in the Symposium sessions, shown in the summary section below, provides an idea of the variety of interesting topics covered.

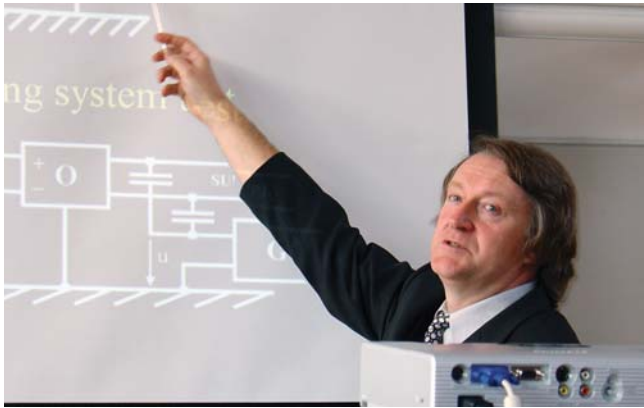
The following improvements with respect to the previously held Symposiums were emphasized by the participants:

- All the papers in the proceedings were published in English, which permits a better transmission of the scientific results reported at the Symposium at an international level;
- The balance between the scientific sessions and the cultural and sightseeing program offered an opportunity for the participants to get acquainted with the architectural and artistic treasures of Saint Petersburg;
- A big effort was made by the local organizers to improve the orientation inside the University building to indicate the position of the different rooms where the sessions took place.

The next (7th Edition) International Saint Petersburg Symposium on Electromagnetic Compatibility and Electromagnetic Ecology is scheduled for June 2007. The venue will again be



Elya Joffe explains with his usual talent the shipboard's EMC problems.



Dr. A. A. Worshevsky demonstrates the crucial importance of good grounding during the “Shipboard EMC” workshop organized and sponsored by the IEEE EMC Society.

at the Saint Petersburg State Electrotechnical University “LETI”, an institution which will celebrate in 2006 its founding 120 years ago.

The organizing committee will work on improvements to the symposium in the meantime. Suggestions for improvement include paying for registration fees using credit cards, providing better information to people who have registered or have announced that they will attend, and organizing a “Best Student Paper Award”. Even without a cash prize, such an award can be very stimulating for a Ph.D. student.

Summary of Symposium Sessions

Session 1 “EMC of Power Installations” with 24 papers. (Co-chairs Professor M. Ianoz, G. Wollenberg and V.N. Sarylov.) Papers included those by B. W. Jaekel (Germany), A. A. Worshevsky (Russia), B. N. Sarylov (Russia), H. Mecke, R. Doebelin, T. Winkler (Germany), G. Klaric Felic and R. Evans (Australia), A. Lipsky, M. Slonim, O. Goldberg (Israel), A. Dolente, U. Reggiani and L. Sandrolini (Italy, L.L. Sinenko (Russia), respectively. We would like to mention in particular the papers of V. V. Klovov and N. V. Silin (Russia) which proposed interesting ideas for the analysis of the electromagnetic radiation of a power transformer and that of S. V. Kotchetov



Abraham Rubinstein (Switzerland), Carolina Alonso (Germany), Martin Valek (Germany) and Maxim Ermakov (Russia), from right to left, exchanged their impressions during a visit to the Peter the Great Summer Palace at Peterhoff.



Yu. M. Balagul (Russia), S.V. Kochetov and Professor G. Wollenberg (Germany) concentrated in following the presentation of Professor Iu. G. Grigoriev at the Plenary Session.

and G. Wollenberg which discussed a promising approach to increase the stability of the PEEC-method.

Session 2 “Electromagnetic Interaction and Shielding” with 15 papers. (Chair Professor N.V. Korovkin.) Here we would like to comment on the study performed by J. L. Wojkiewicz, N. N. Hoang, N. Redon and J. L. Miane (Germany and France) on the shielding properties of nano-composite materials. A new contribution to the distribution of currents on the perimeter of braided shields was reported by J. Nitch, H. J. Scheibe, Yu V. Varlamov, N. V. Korovkin and V.L. Chechurin (Germany and Russia). We should also mention the papers of C. A. Monje, S. Helmers, E.G. Diez (Spain and Germany) and of S.V. Kotchetov and G. Wollenberg (Germany).

Session 3 “Spectrum Management and Monitoring” with 11 papers. (Chair Professor I.P. Khartchenko) The session addressed the theoretical and practical questions of a rational use of the radio frequency spectrum and the control of the emission of the radioelectronic instruments. Several papers of this session presented the results obtained by Professor I. P. Khartchenko and his colleagues from the Saint Petersburg State Telecommunication University “Bontch-Bruevitch” pertaining to the control of radio frequency spectrum and the original instrumentation they developed. Interesting results were also reported by the scientists from NII Radio (Moscow), A. P. Pavliuk, N. V. Vasekho and others at this important center for spectrum management. The presence in this session of papers from the Main Radio Frequency Center of the Russian Federation, the Saint Petersburg Center, the Centers of Southern Russia and of the Far East and of Kirghizstan, fostered discussion on problems of national and regional interest.

Session 4 “EMC in Radio Link Systems” with 10 papers. (Co-chairs Professor S.B. Makarov and Dr. V.S. Gutin.) This session addressed EMC problems in telecommunication systems using the CDMA approach. The paper of the Moscow Technical Telecommunication and Computer Science University (authors Professor Smirnov et al.) dealt with the EMC problems inside the system and between systems, when the standard CDMA-450 is used. In another paper presented by Professor V.P. Ipatov and his Ph.D. student A.V. Dudkov (Finland), results were reported pertaining to the optimization of phase controlled sig-



Professor K. H. Gonschorek and Mrs. Gonschorek enjoy the cruise on the Neva in the evening northern sunset.

nals encoded in an arbitrary way. An interesting concept concerning the development and the consequences of very short pulsed interferences was proposed by Professor V. D. Tchelshev. Finally, an interesting approach of signal processing using special antenna grids was proposed by Russian specialists and by Professor G. G. Chavka (Poland) and his co-authors.

Session 5 “Antennas and Radio Wave Propagation” with 25 papers. (Co-chaired by Professor G.G. Chavka and B. V. Sosunov.) Dr. S. Loyka (Canada) presented an interesting paper about the link between information theory and electromagnetics. We would also like to mention the papers prepared by a group of authors under the direction of the session co-chairmen Professor G.G. Chavka and B.V. Sosunov. Of particular interest was the work of Dr. S. Tkachenko and Professor J. Nitsch (Germany), which was read by Professor N. V.Korovkin, “About the excitation of the electromagnetic field of smoothly curved conductors” where the authors propose a calculation method for the electromagnetic parameters of metallic systems. We would also like to mention the papers by the following authors: Ç. Uluşık and L. Sevgi (Turkey) and O.A. Babushkin, O. L. Bolikhov, A. A. Golovkov, N. N. Radomski, V. A. Stepanov, M. I. Sugak (Russia) and the paper of N.V. Ostrovski about the confrontation between the emission and the wave theories of electromagnetic radiation.

Session 6 “The Construction of Radio-Electronic Devices Taking into Account EMC Aspects” with 13 papers. (Co-chairs Professor L.N. Ketchiev and E.B. Solovieva.) The papers were presented by authors from Russian, German, Mexican, USA, and Polish Universities. Several review papers were also presented by Professor V. N. Dianov and L. N. Ketchiev.

Session 7 “EMC in Printed Circuit Boards” with 7 papers. (Chaired by Professor Tchermoshentsev.)

Session 8 “Electromagnetic Monitoring, Measurements, Certification, Test Instrumentation” with 28 papers. (Co-chaired by Dr. A. A. Worszewski and Dr. Tukhas.) This was one of the most interesting sessions of the Symposium. Of particular interest were the papers by V. I. Larkina and Iu. Iu. Rujin (Russia) “Measurement of parameters of the cosmic plasma as a tool to estimate the pollution of the environment” and that of C. Giliberti, A. Bedini, R. Palomba, E. D’Emilia, C. V. Magli,



“Is it really true what you tell us?” wondered Professor M. Hayakawa (Japan) during one of the Symposium sessions.

and L. Giuliani (Italy) about the electromagnetic environment in the town of Rome. It is worthwhile to mention also the papers of E. A. Svidotch (Russia), H. Haider, G. Neubauer, M. Kollar (Austria and Slovakia), K. Yamamoto (Japan), A. S. Adaliov, N. V. Korovkin, M. Hayakawa (Japan and Russia), A. Rubinstein, F. Rachidi (Switzerland), V. A. Tukhas (Russia), A. A. Worszewski (Russia), Yu M. Balagul, M. Sakulin (Russia and Austria), V.M. Kuprienko, N.A. Ostafitchuk and R.M. Ostafitchuk.

Session 9 “Sources and Influence of Natural Electromagnetic Radiation” with 12 papers. (Co-chaired by Professor M. Hayakawa and A. A. Kostrominov.) This topic has been considered a relatively new domain for EMC, i.e., the influence of low and very low frequency natural electromagnetic fields on technical systems and the possibility to use these fields to predict the behavior of natural phenomena. An important work was the paper by Professor M. Hayakawa (Japan) and a group of scientists working under his direction (Iu. Ida, K. Gotoh, T. Itoh, N.A. Smirnova, and I.V. Iakovitskya (Japan and Russia) and also that of R.M. Ostafitchuk, about the action of geomagnetic storms on long power transmission lines.

Session 10 “Biological Effects of Electromagnetic Fields” with 19 papers. (Co-chaired by Professor Iu. G. Grigoriev and V. N. Nikitin.) This session raised unusually high interest among the participants. The papers presented gave evidence of the higher concern of the world society pertaining to possible adverse effects of electromagnetic fields in the environment for human beings or for nature. A large part of the time was dedicated to the discussion of assumed, but not yet proven, effects due to base stations and mobile phones. The effect of electromagnetic fields on working environments was also taken into account (for instance in hospitals, or inside cars) and statistical data about the electromagnetic environmental noise and congenital malformations in the town of Tomsk (Russia) were provided. The results of studies on electromagnetic field effects on animals, insects, and at the cellular level were also reported. **EMC**