INTERNATIONAL CONFERENCE ON LASER TECHNOLOGIES WAS HELD IN UKRAINE

7th International Conference «Laser Technologies in Welding and Material Processing» (LTWMP-2015) was held on September 14–18, 2015 at «Kurortny» boarding house in Odessa (Ukraine). It was organized by the E.O. Paton Electric Welding Institute of the NASU, Laser Technology Research Institute of NTUU «Kiev Polytechnic Institute», Laser Center of Zheijiang University of Technology, and International Association «Welding». Prof. B.E. Paton and Prof. V.S. Kovalenko are the co-chairmen of the Program Committee.

This Conference starting from May 2003 has become a tradition and gathers laser experts from the different countries of the world every two years. 40 scientists and specialists from Ukraine and China as well as specialist with remote participation from Germany, Poland and Spain took part in the Conference work. The Conference was organized in a form of plenary and poster sessions. Working languages of the Conference are Russian, Ukrainian and English with simultaneous translation of the papers. 33 presentations were discussed in a course of plenary and poster sessions.

The Conference was opened by presentation of Prof. V.S. Kovalenko «Development of 3D additive processing for product manufacturing in modern industry» (Laser Technology Research Institute of NTUU «KPI»). The presentation noted that the largest amount of products in present time is manufactured by such classical technologies as casting, welding, forging, stamping, machining etc. At the same time novel and quite original technology of 3D printing and fast prototyping was proposed in the recent decades. Such technologies combine three main factors, namely material (metallic plate or powder, solid and liquid polymer, paper, wood etc.), energy (laser, electron beam, electric discharge, plasma flow etc.) and mathematical model of future part.

Series of presentations of Prof. V.I. Krivtsun with colleagues from Ukraine, Germany and China were dedicated to theoretical analysis of physical processes taking place in laser and hybrid welding.

Presentations on application of lasers in medicine were also made.

There are some presentations which give an idea of topics opened at the Conference:

- «Research progress of supersonic laser deposition technology» by Jianhua Yao (Laser Center of Zhejiang University of Technology, China) and V. Kovalenko («KPI»);
- «Interaction of CO_2-laser beam with electric arc plasma in hybrid (TIG + laser) welding» by I. Krivtsun, I. Krikent, V. Demchenko (PWI), U. Reisgen, A. Zabirov, O. Mokrov (Welding and Joining Institute, Aachen, Germany);
- «Increase of efficiency of hybrid welding of aluminum alloys» by I. Krivtsun, V. Sidorets, V. Khaskin, V. Korzhik, A. Bushma (PWI), Luo Ziyi (Guangdong General Research Institute for Industrial Technology (Guangzhou Research Institute of Nonferrous Metals), China);
- «Microstructure and wear-resistant properties of WC/SS316L composite coatings prepared with supersonic laser deposition» by Bo Li, Zhihong Li, Lijing Yang, Jianhua Yao (Research Center of Laser Processing Technology and Engineering, Zhejiang University of Technology, China);
- «Laser manual machine for welding of railway transport products» by V. Shelyagin, V. Kurilo, I. Shuba, A. Bernatsky (PWI), Wang-Chunsheng (Changchun Railway Car Building Plant, China), Wan Dinda, Zhen Shukhuey (China-Russian Technological Park, Changchun, China);
- «Effect of electric-magnetic field on WC particulate-reinforced metal matrix composite layers by laser melt injection» by Wang Liang, Yong Hu, Shiying Song, Sanpin Lai, Jianhua Yao (Research Center of Laser Processing Technology and Engineering, Zhejiang University of Technology);
- «Metal penetration in TIG, laser and hybrid (TIG + laser) spot welding. Experimental study» by I. Krivtsun, V. Abdulakh (PWI), M. Svirzhevskaya («KPI»), U. Reisgen, B. Gerhards (Welding and Joining Institute, Aachen);

• «Metal penetration in TIG, laser and hybrid (TIG + laser) spot welding. Mathematical modelling» by I. Krivtsun, K. Hubaiev, I. Krikent, A. Semenov (PWI), U. Reisgen, A. Zabirov (Welding and Joining Institute, Aachen);

• «Peculiarities of synergic activation of laser welding of steels with the help of argon arc with tungsten electrode (TIGAL process)» by D. Kovalenko, I. Krivtsun, I. Kovalenko (PWI), U. Reisgen, B. Gerhards, A. Zabirov (Welding and Joining Institute, Aachen);

• «Advancements in joint research of laser cladding at components manufacturing» by J. Yao, Q. Zang, H. Hu (Laser Center of Zhejiang University of Technology), V. Kovalenko, M. Anyakin, R. Zhuk («KPI»);

• «Development of technologies for laser welding of body elements of freight railway cars» by V. Shelyagin, V. Khaskin, A. Bernatsky, A. Siora, A. Palagesha, A. Tunik, E. Goncharenko (PWI), A. Chepurnoy (Scientific-Engineering Centre «RTKh», Mariupol, Ukraine);

• «Plasma + laser — new capabilities of plasma-powder surfacing» by A. Som (Plasma-Master Ltd., Kyiv, Ukraine), I. Krivtsun (PWI);

• «Experimental research of hybrid welding process in combination of GTA with CO_2- or Yb:YAG-laser beam» by I. Krivtsun (PWI), U. Reisgen, B. Gerhards, A. Zabirov (Welding and Joining Institute, Aachen);

• «Laser-arc hybrid welding of aluminum alloys» by V. Shelyagin, V. Khaskin, A. Bernatsky, A. Siora, A. Palagesha (PWI).

A Round Table «Perspective directions of development in area of laser technologies» took place at the end of the Conference. Relevant problems of development of laser technologies and peculiarities of physical phenomena, taking place in interaction of laser irradiation and plasma in realizing of hybrid technologies based on energy of laser irradiation, were discussed.

Program and abstracts of papers was published before the Conference opening. Proceedings of LTWMP-2015 will be published till the end of 2015. Proceedings of the previous LTWMP conferences can be ordered in the Editorial Board of «Avtomaticheskaya Svarka» Journal or get in open access from the site of the Paton Welding Institute Publishing House by reference http://patonpublishinghouse/eng/proceedings/ltwmp.

Friendly, hospitable and creative atmosphere promoted development of useful discussions and arrangement of business contacts. The Conference participants unanimously agreed on proposal of performance of the next 8th LTWMP Conference in the middle of September 2017 in Odessa, Ukraine.

The organizing committee expresses thanks and gratitude to Company «High-Energy Technologies» (Kiev, Ukraine) for beneficent help provided for performance of the 7th LTWMP-2015.

A.T. Zelnichenko, PWI

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E.O. Paton Electric Welding Institute of the NAS of Ukraine
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