

Biography of Sergei N. Rukin

Sergei N. Rukin was born in 1956. He received the M.Sc. degree in electrical engineering from Novosibirsk Electrical Engineering Institute, Novosibirsk, Russia, in 1978 and the Candidate of Science and Doctor of Science degrees from the Institute of High Current Electronics, Russian Academy of Science, Tomsk, Russia, in 1988 and 1998, respectively. He has been with the Institute of Electrophysics, Russian Academy of Science, Yekaterinburg, Russia, since 1986 and is currently the Head of the Pulsed Power Laboratory. His research interests are the physics and technology of high-power solid-state switches, repetitive pulsed power, and high-current electronics.

Dr. Rukin is a recognized authority in pulsed power science and technology. The most important contributions to pulsed power research and development made by Dr. Rukin consist in discovery of the phenomenon of nanosecond current cutoff in silicon semiconductor diodes at high current densities known as the SOS effect (Semiconductor Opening Switch), and elaboration of a new approach for nanosecond high-power solid-state generators development based on semiconductor opening switches.

The discovery of the SOS effect was a break-through of the semiconductor generators into pulsed power technology, since the peak power of new semiconductor generators named SOS generators was increased around 2 orders of magnitude. At present SOS generators are capable of producing nanosecond voltage pulses having the amplitude of up to 1 MV at the peak power of GW-range and delivering to external load the average power of units and tens of kW. Distinguish features of the SOS generators consist in a solid-state energy switching system, high rep-rate capability, and a long lifetime.

The results of Dr. Rukin and his co-workers research and development represented as samples of SOS-based scientific equipment have been widely spread around the world. They are used by researches from different countries including Russia, USA, United Kingdom, Germany, France, China, Israel, Japan, South Korea, and India. The most typical applications of the equipment developed include high current E-beam and X-ray generators, gas lasers pumping, ozone generation, streamer corona discharge technologies, radar systems, and high-power microwaves.

Dr. Rukin has presented his work as an invited and plenary speaker at international conferences and symposiums on Pulsed Power, High Power Particle Beams, and High Current Electronics. He also was invited and gave several lectures at different organizations in Russia, USA, China, and Korea. For his contributions to research, Dr. Rukin was awarded the State Award of Russian Federation in science and technology in 2002.