

CONFERENCES AND SYMPOSIA

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Commemoration of the centenary of the birth of Academician V V Migulin

(Scientific session of the Physical Sciences Division of the Russian Academy of Sciences, 28 September 2011)

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The scientific session of the Physical Sciences Division of the Russian Academy of Sciences (RAS) commemorating the 100th anniversary of the birthday of Academician V V Migulin was held on September 28, 2011 at the conference hall of the P N Lebedev Physical Institute of the RAS.

The following reports were put on the session agenda posted on the website www.gpad.ac.ru of the RAS Physical Sciences Division:

(1) **Gulyaev Yu V** (V A Kotel'nikov Institute of Radioengineering and Electronics, RAS, Moscow) "Radiophysical methods in biomedical research";

(2) **Vyatchanin S P** (M V Lomonosov Moscow State University, Moscow) "Parametric oscillatory instability in laser gravitational antennas";

(3) **Kuznetsov V D** (N V Pushkov Institute of Terrestrial Magnetism, Ionosphere and Radiowave Propagation, RAS, Troitsk, Moscow region) "Solar-terrestrial physics and its applications".

The opening address and articles written on the base of the oral reports 2 and 3 are published below.

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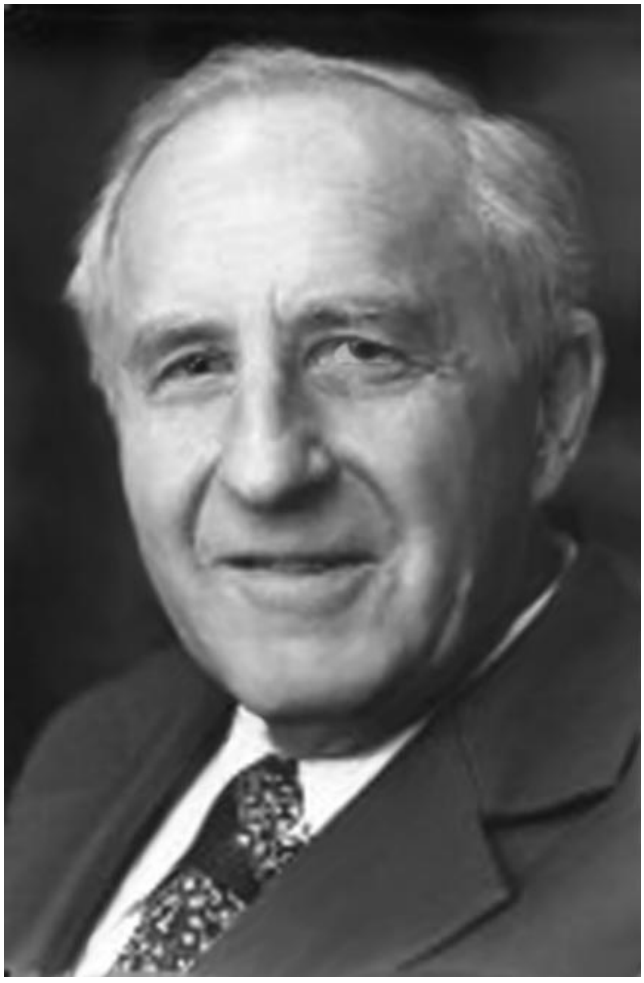
Opening address

Yu V Gulyaev

Today's session is devoted to the memory of Vladimir Vasil'evich Migulin. Organizers asked me to say a few words about him because he worked for some time with us at the Institute of Radioengineering and Electronics (IRE).

V V Migulin was born in 1911 in the town of Sereda (renamed Furmanov) in the Ivanovskaya region. In 1932, he graduated from the Leningrad Polytechnic Institute, and started his career in 1934 in N D Papaleksi's group at the Leningrad Electrophysical Institute. After the Academy of Sciences and most of its research institutes moved to Moscow in 1934, V V Migulin began to work at the P N Lebedev Physical Institute of the RAS under the supervision of L I Mandelshtam and N D Papaleksi, where he developed various parametric amplifiers, generators, and converters — it was he, in fact, who really launched this whole field.



Vladimir Vasil'evich Migulin
(10.07.1911 – 22.09.2002)

At the next stage, V V Migulin redirected his research to studying the propagation of radio waves. He began working

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on radiointerferometry, which made it possible to determine the phase structure and velocity of propagation of waves along the Earth's surface.

During WWII, he developed radio navigation and radar systems for the air force.

In 1951, V V Migulin was appointed Director of the Sukhumi Physical-Technical Institute, where work on the Soviet Atomic project was conducted, including work on rocket design. The research staff of the Institute involved many German scientists brought to the USSR from defeated Germany.

I will make a short detour here. It is likely that many of you knew the German scientist Klaus Thiessen, or heard about him. In 1953–1954, he was a student at Moscow State University. At the time, I was a student at the Moscow Institute of Physics and Technology (FizTekh), and we were acquainted. Well, his father Peter Adolf Thiessen was the person who developed the fuel for the German V-2 rocket. As you know, once WWII ended, the Americans got hold of rocket designer von Braun, and we Soviets got hold of P A Thiessen, Hitler's former science advisor, and this very P A Thiessen, essentially the technical director of the Sukhumi Institute, then worked for Stalin.

Between 1957 and 1959, V V Migulin was the acting deputy to the IAEA Director General in Vienna.

In 1962–1969, V V Migulin headed the Department of Parametric and Electronic Devices at the RAS Institute of Radioengineering (IRE). He appears to be the first person to bring attention in 1968 to applying a physical novelty, SQUIDs, as potential quantum interference sensors of magnetic fields. Our first SQUIDs were designed under his guidance at this Department. He was able to assemble a team of experts known to many of you: V P Koshelets, G A Ovsyannikov, and some others. That is all his scientific school, and today it is to a great extent thanks to V V Migulin and the school he created that the IRE RAS has stayed at the forefront of SQUID development and applications. My subsequent talk on biomagnetic measurements will partly be devoted to applications of SQUIDs possessing extremely high sensitivity.

In 1969, V V Migulin became Director of the RAS Institute of Terrestrial Magnetism, Ionosphere and Radiowave Propagation (IZMIRAN); he headed this Institute for 20 years. V V Migulin made a great contribution to progress in a new field of research — solar-terrestrial physics. He was also a scientific leader of the Interkosmos-19 program; the pioneering results of space exploration which made us all so proud were actually obtained under his guidance.

The spectrum of V V Migulin's interests in science was exceptionally wide. I even remember, although I cannot expand on this topic here, that he once described how in some obscure way he and Zel'dovich together had even discovered somewhere quarks. In addition, Vladimir Vasil'evich never stopped doing work of great social significance. He was Deputy Secretary-Academician of the Physical Sciences Division of the RAS for nearly 30 years. It is fair to say that in reality he shared the management of the Division with the Secretary-Academician.

V V Migulin also took part in the work of international organizations. One such organization was URSI (the French abbreviation of Union Radio-Scientifique Internationale). Even though a large number of international organizations exist in the fields of radiophysics, radio electronics, etc., most of them are applications-oriented. For example, in the long run the IEEE (Institute of Electrical and Electronics Engineers) is precisely the institute for engineers in the fields of radio electronics, electrical engineering, etc., and thus mostly concerns itself with the practical applicability of the results of research. URSI is actually the only organization focusing primarily on fundamental problems. Well, for five years Migulin was the Vice-President of the entire URSI, and for 20 years he headed the URSI Russian Committee. At the moment, I am in fact his legal successor, as I now head the same URSI committee. Consequently, I am well informed about his activities in the international arena as well.

Vladimir Vasil'evich Migulin had an exceptionally wonderful personality. Very important among his characteristic features was the absolute reliability of his word; he was a model workaholic and was always very upset if he was late arriving for anything — his time was planned to the minute, and not only regarding his job but in dealing with people as well. When Vladimir Vasil'evich talked to you, he listened attentively, looking straight at you, and always tried hard to do something and help. Even after resigning from the IRE directorship in 1988, when I became IRE Director, he would be a regular visitor, enquiring about progress in the Department of Superconductor Electronics, which was very much his brainchild; he was always very close to it.

The memory of him is very dear to us, very clear and very warm, and I think most people who knew him feel that way. He was a wonderful person.

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Parametric oscillatory instability in laser gravitational antennas

S P Vyatchanin

1. Introduction

I had the honor of knowing Vladimir Vasil'evich Migulin when I was an undergraduate student, a postgraduate student, and then a staff member in the chair headed by him. Unfortunately, I did not maintain close contact with him, but I was well aware of the high prestige he enjoyed among the chair staff members.

V V Migulin is known for his work on parametric processes [1–3]. The subject of my report is the undesirable parametric instability effect, which is also inherently parametric.

An obvious illustration of parametric oscillatory instability is the model of a two-circuit parametric amplifier (Fig. 1) which consists of two parallel oscillatory circuits connected with a variable coupling capacitor $C_0(t) = C_0 + \delta C \cos \omega_0 t$ [4]. As is well known, the operation of the parametric amplifier becomes unstable for sufficiently strong pumping (i.e., when the modulation part δC of the coupling capaci-

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