Dear Readers!

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Herewith we would like to call your attention to a special edition of *Acoustical Physics* dedicated to the issues of state-of-the-art medical acoustics. The range of the sound and supersonic frequencies is from 1 Hz to hundreds of MHz. However, most medical applications are bound up with the use of ultrasound. This is a rapidly developing field of science and technology. Ultrasound is applied in a specific way for diagnostics where the popularity of supersonic methods can be compared with the methods of X-Ray and magnetic-resonance. Various ultrasound devices now available in any clinic serve to visualize internal organs of the human body, to watch the fetus development and to monitor the heart work. Supersonic methods are used to measure vascular blood flow, to analyze the state of bone and tissue, and to measure the components of blood. Ultrasound microscopy serves to study tissues with the resolution up to submicrons. Useful diagnostic information can be obtained investigating tissues by means of not only longitudinal but also shearing surface waves and at the analysis of the ultrasound's propagation in the tissues. Contemporary medicine would be impossible without ultrasonic physiotherapy and treatment of many diseases of the locomotor system. For the most recent years the traditional methods of acoustical diagnostics were supplemented by the ones based on high intensity focused ultrasound (in foreign publications – HIFU). The number of operations employing intense focusing ultrasound for destruction of non-malignant and malignant tumors is several tens of thousands. Low-traumatic operations on the

destruction of the tissues of the prostate have become widespread. Focused shocked pulses have already been used for more than 30 years for the destruction of nephrolith. Other ultrasound methods not applied until recently or considered exotic are quickly developing. These are to stop bleeding, thrombus dilution, directional transport and increase of the impact efficiency of medicine, treatment of joints, acceleration of the union of complex fractures, blocking of nerve conduction, and noninvasive liposuction.

The present issue incorporates works both of Russian and foreign researchers as well as articles containing results of international cooperation. Only several months have passed from the appearance of the idea to create this issue to its publication. Thus, the issue content turns out to be a “momentary cut” of investigations carried out lately. We hope that this issue of *Acoustical Physics* will be interesting and supplement the reviews published in Russian journals for the last few years.

Their list is as follows.

1. M. R. Bailey, V. A. Khokhlova, O. A. Sapozhnikov, et al., *Akust.Zh.* **49**, 437 (2003) [*Acoust. Phys.* **49**, (2003)].
2. O. V. Rudenko and A. P. Sarvazyan, *Biomed. Radioelektron.*, No. 3, 4 (2000).
3. O. V. Rudenko, *Usp. Fiz. Nauk* **50**, 374 (2007).

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