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ABSTRACTS

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General Physics Institute RAS*

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Session A

GAS AND PLASMA LASERS, METAL VAPOR LASERS

A-1

MULTIWAVELENGTH GENERATION IN METAL VAPOR LASERS WITH A NANOSECOND PULSE DURATION**A.N. Soldatov***Tomsk State University, 36 Lenin Ave., 634050 Tomsk, Russia, general@tic.tsu.ru*

The report gives an overview of the work on lasers with nanosecond pulses of generation in vapor-gas active media performed in the last few years at the Tomsk State University under the guidance of the author.

The main attention is paid to two directions: firstly, the possibilities of expanding the set of generation wavelengths that would overlap the visible and infrared spectrum are investigated; secondly, attention was paid to a significant increase in the energy characteristics of the strontium vapor laser due to an increase in the volume of the active medium and using the "generator-amplifier" system.

This research carried out in 2017 was supported by "The Tomsk State University Academic D.I. Mendeleev Fund Program" Grant (No. 8.2.04.2017).

A-2

LUMINESCENCE SPECTRA OF ACTIVE MEDIA OF LASERS ON P-S AND D-P TRANSITIONS OF INERT GASES UNDER ION BEAM EXCITATION**A.K. Amrenov and M.U. Khasenov***National Laboratory Astana, 53 Kabanbay Batyr Ave., 010000 Astana, Kazakhstan, nla@nu.edu.kz*

Research on studying of luminescent radiation of the inert gases was conducted at DC-60 heavy ion accelerator. In this paper the emission spectra of inert gases and their mixtures were measured in the broad spectral range (200–1100 nm). Intensities were adjusted for the relative spectral sensitivity of the experimental facility at the range of 400–1000 nm, which embraces almost all lines of 2p–1s transitions of inert gases atoms. In UV spectral region, besides the molecular bands, connected with the presence of admixtures of water vapors, nitrogen, so-called "third continuums" of argon, krypton and xenon are observed. First time strong bands of heteronuclear ion molecules were registered at the average power of pumping. Population mechanisms of working levels in lasers with the ionizing pumping on transitions of inert gases atoms is discussed; influence of admixtures in gases at luminescent properties was studied.

A-3

CIRCULARLY POLARIZED LASER EMISSION ON THE ALKALI D₂ LINES: OPTICAL PUMPING OF A TRANSIENT DIATOMIC MOLECULE**A.E. Mironov and J.G. Eden***University of Illinois, 306 N. Wright Str., 61801 Urbana, Illinois, USA, amirono2@illinois.edu*

Spin exchange optical pumping has been known for more than 30 years [1]. This process has been mainly used for producing hyperpolarized noble gases for nuclear magnetic resonance measurements.