	Hypersound velocity in sapphire m/sec			MB component intensity ratio MB (I_L/I_T)		
	Experiment		Calcul.		Experiment	Calculation
	3, a	3, b				
v_L	–	10620 ± 300	10680	3, a	0	0,0017
v_T	6180 ± 200	6150 ± 300	6210	3, b	0,74	0,736

It is seen from the table that the calculation agrees well with experiment.

The use of the Ar^+ laser in our study has made it possible to observe simultaneously both the "longitudinal" and the "transverse" MB components and to determine their positions and intensity ratios. In [6], the 2537-Å mercury-lamp line was used to excite scattering in sapphire. One can assume that the MB components observed in [6] were due to the transverse hypersonic wave. Under the conditions of [6], as shown by our calculations, the intensity of the "transverse" component is 5 times the "longitudinal" intensity.

The singularity of light scattering in sapphire can apparently be used for selective excitation and longitudinal and transverse hypersonic waves by using the stimulated-scattering technique.

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GENERATION IN THE ULTRAVIOLET WITH FREQUENCY TUNING, USING A PARATERPHENYL SOLUTION AND EXCITATION WITH A FLASH LAMP

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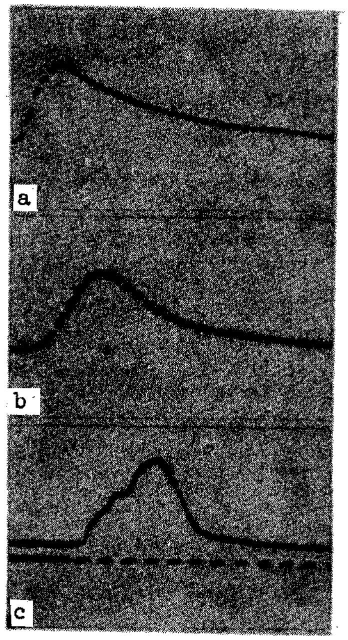
We report here attainment of lasing with smooth frequency variation in the 330 - 350 nm range, using a solution of paraterphenyl and excitation with a flash lamp.

The development of tunable UV lasers is one of the vital problems of quantum electronics. The use of organic solutions as the active medium offers great possibilities in this respect. Generation in the near ultraviolet (330 - 370 nm) was attained in [1, 2] on a number of organic scintillators excited by the fourth harmonic of a neodymium laser. Investigations of the generation and spectral characteristics (especially the absorption spectra on the excited states) have shown that the most promising of the compounds that fluoresce in the UV is paraterphenyl. A laser using a solution of paraterphenyl (say in cyclohexane or ethanol) has a low excitation threshold, the shortest generation wavelength (340 nm) in a nonselective resonator, and a sufficiently broad and smooth tuning range (325 - 365 nm at 0.6 MW pump power). Paraterphenyl is apparently the best compound for the development of tunable UV lasers pumped with flash lamps. There is only one known study [3] where lasing (without frequency variation) was obtained with a paraterphenyl solution and a pump of this type.

The paraterphenyl solution was excited with a pump system having the required ultraviolet content in the lamp radiation. It consists of a coaxial lamp with a cell (discharge gap length 45 mm, outside diameter of cell 6 mm, length 65 mm), a low-inductance parallel-plate capacitor (40 nF, 25 kV), and a low-inductance discharge gap, and also a vacuum system to fill the lamp with xenon and a power supply[1)].



Oscillograms of pulses of the lamp radiation in the 280 - 380 nm band (UFS-2 filter) (a), of the fluorescence (b), and of the generation (c) of a solution of paraterphenyl in cyclohexane, W = 9 J. The time markers are spaced 10 nsec apart.

The parameters of the light pulse can be judged from oscillograms a and b in the figure. We see that the duration of the leading front (from 0.1 to 0.9 of peak value) in the UV region does not exceed 40 nsec. The pulses were registered with a coaxial photocell FEK-22 and with an oscilloscope I2-7.

Lasing was obtained with solutions of paraterphenyl in cylcohexane and in ethanol. In a nonselective resonator 120 mm long, made up of flat mirrors with $R'_{340} = 0.9$ and $R''_{340} = 0.85$ (R_{340} is the reflection coefficient at 340 nm) the electric threshold pump energy W_{thr} did not exceed 8 J in a wide range of variation of the system parameters, viz., inside cell diameter d = 2 - 3 mm, discharge gap thickness t = 0.1 - 0.5 mm, xenon pressure p = 50 - 250 Torr, solution concentration C = $(3 - 15) \times 10^{-4}$ M, and with and without a silicon-oxide coating on the outer surface of the lamp. The table and Fig. c show some experimental results obtained by exciting solutions of paraterphenyl, and also of POPOP and rhodamine-6G, at d = 2 - 4 mm, t = 0.25 - 0.3 mm, p = 80 - 100 mm Hg, and in the presence of a reflector.

To tune the generation frequency of the paraterphenyl solutions, one of the mirrors was replaced with a diffraction grating, and the resonator was lengthened to 220 mm. The windows of the cell were misaligned (by approximately 1°) in order to suppress generation on the end faces of the cell. Two gratings were used: N = 1200 lines/mm, $R_{400} = 0.54$ in first order of diffraction, and N = 200 lines/mm and a blaze angle of about 70°.

[1)]A detailed description of the laser construction has been submitted to the editors of the journal "Pribory i tekhnika eksperimenta."

Compound (solvent)	Concentr. 10^{-4} M	R'	R''	W_{thr} J	λ_{gen} nm
Paraterphenyl (cyclohexane)	13	0,9	0,85	2,5	341
Paraterphenyl (cyclohexane)	–	0,9	window* of cell	3,5	–
Paraterphenyl (cyclohexane)	–	window of cell	window of cell	5,0	–
Paraterphenyl (cyclohexane)	-	0,9	grating 1200 lines/mm	6 – 10	330 – 350
Paraterphenyl (cyclohexane)	–	0,9	grating 200 lines/mm	6 – 10	336 – 341
Paraterphenyl (ethanol)	10	0,9	0,85	3,0	341
POPOP (cyclohexane)	5	0,97	0,89	4,5	–
POPOP (cyclohexane)	–	0,97	window of cell	8,0	–
Rhodamine-6G (ethanol)	1	window of cell	window of cell	< 1,5	–

* In this case the generation energy was about 10^{-3} J at a pump energy 10 J.

The threshold pump values and the generation tuning range are given in the table. When the first grating was used, several lines were simultaneously excited at certain grating angles; only one line with width 2 Å was obtained with the second grating.

The low solution-excitation threshold energies listed in the table indicate that such a pumping system is effective for the excitation of a large number of other organic compounds.

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ELECTRIC PROPERTIES OF LINEAR CONDUCTING CHAINS OF Pt ATOMS IN $K_2Pt(CN)_4Br_{0.3}\cdot 2.3\ H_2O$

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Little's well-known idea [1] that a nonphonon mechanism of superconductivity is possible in one-dimensional conducting systems has recently stimulated interest in the study of the properties of such systems. One example of such a compound with a quasi-one-dimensional conductivity are complexes of tetracyanquinodimethane [2, 3]. Another example are the so-called