tion (7), of the invariants of the tensor $T_{jk\ell m}$ of μ-vacuum. It is easy to show that the vacuum invariants which change in space-time cannot be interpreted as being energy-momentum components, since they do not influence the structure of the energy-momentum tensor of μ-vacuum (for example, when $\mu = 0$ we also have $T_{jk} = 0$). From this point of view, such problems as the determination of the density of the energy of a gravitational wave cannot have a solution. We can speak only of loss or acquisition of energy by a system, made up of ordinary matter and an electromagnetic field, interacting with the μ-vacuum. In the latter, on the other hand, the conservation and propagation laws have a form different than for matter with $T_{jk} \neq \mu g_{jk}$. The vacuum invariants were studied by Petrov [1]. In the particular case $\mu = 0$, their transport was investigated by Pirani [2] and later by Ehlers and Sachs [3].

Inasmuch as Einstein's equations (5) follow from a system (6), the latter lead also to the results which follow from Einstein's equations. The system (6), however, describes directly also processes in media which have the properties of vacuum, as well as in mixed media in which a vacuum component is essential, whereas such processes can be described with the aid of (5) at best only indirectly (for example, as a consequence of specifying the Cauchy data on some space-like surface). Since, however, the system (6) conserves furthermore the unity of geometry and physics, as is characteristic of general relativity, it seems to us that it can be regarded as a natural possible generalization of Einstein's equations.

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NEODYMIUM-GLASS LASER WITH PULSED Q SWITCHING

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We used an electron-optical shutter to modulate the Q of a neodymium-glass laser. This shutter ensured a shorter Q-switching time than the previously used device with rotating prism [1]. The components of the laser were: a mirror with reflection coefficient 98% at wavelength 1.06 μ, the shutter, and two neodymium-glass (KGSS-7) rods each 120 mm long and 10 mm in diameter, with parallel end surfaces. The excitation was by means of two helical lamps with pump energy 8 kJ each and duration 600 μsec (at the 0.3 level). The shutter consisted of two crossed polarized prisms and a Kerr cell, which was controlled by a pulse with a lifetime of 5 nsec and a duration 600 nsec. The pulse was generated with a long-line generator [2].

The laser radiation consisted of one pulse of polarized light with energy 2 J and duration not more than 20 sec at the 1/2 level. The pulse duration was determined by the resolution time of the FEU-15 photomultiplier (see [1]). The laser beam divergence did not exceed 15'.

The laser pulse was fed to an optical amplifier consisting of one rod 120 mm long and 12 mm in diameter. The radiation energy at the output of the amplifier was 4 J. When this radiation was focused in air with the aid of long-focus lenses (F = 250 and 400 mm), several "sparks" were produced. After the passage of the radiation pulse through the amplifier, local damage to the material occurs within the amplifier rod.

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EFFECTS OF OPTICAL INTERACTION OF TWO DIODE LASERS

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Much attention has been paid recently to the investigations of optical interaction of diode lasers, in connection with the possibility of using these effects to produce logical elements for computer devices [1]. However, an experimental realization of an optical interaction entails considerable difficulties, since the thickness of the active region of diode lasers amounts to several microns. The published experimental papers pertained either to a study of the interaction of two diode lasers with a common resonator [2], or else contained only a qualitative description of the observed effect in the case of separated resonators located at a distance of several dozen microns, when the effects of interaction are not strongly pronounced [3,4].

We present in this communication the results of an experiment on the optical interaction of two gallium arsenide diode lasers located at a distance smaller than 5 μ. The mirrors of their resonators were parallel, and the p-n junctions were in the same plane.

The pair of diodes was obtained by cleaving one crystal, first mounted in a crystal holder, into two parts 425 and 1450 μ long, to which separate contacts were then soldered. The diodes were placed in liquid nitrogen, and were fed with two square-wave pulse generators at amplitudes 0.5 - 25 Å and durations 1.5 μsec. The emission spectrum was investigated with type ISP-51 and DFS-8 spectrographs and recorded with a FEU-22 photomultiplier.

The generation spectrum of the short diode was in the wavelength interval λ_s = 8420 - 8435 Å, and consisted of modes spaced 1.7 Å apart. The generation spectrum of the long diode was in the interval λ_ℓ = 8465 - 8478 Å, with the mode spaced 0.8 - 0.9 Å apart. No detailed